Vol. 895 Number 5

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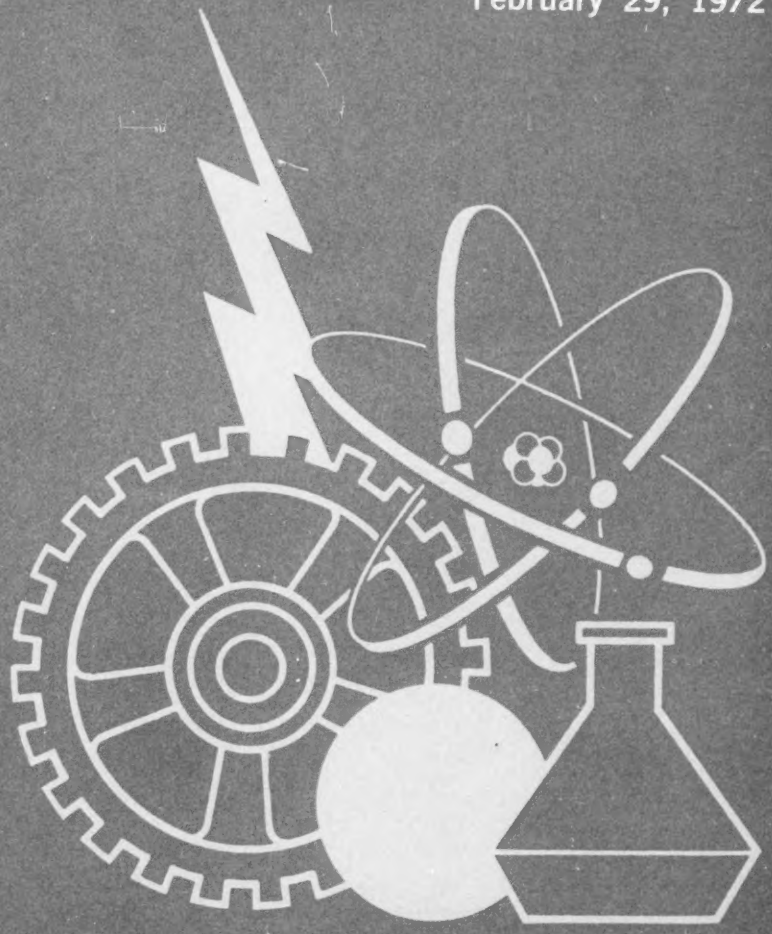
PATENTS

February 29, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 29, 1972 Volume 895 Number 5

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PATENT OFFICE NOTICES

Trademark Office Actions

Effective Apr. 1, 1972, trademark applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Feb. 7, 1972.

Formula and Table Format

[37 CFR Part 1]

Proposed Submission Requirements

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), the Patent Office proposes to amend Title 37 of the Code of Federal Regulations by revising § 1.52 and by adding a new § 1.58.

All persons are invited to present their views, objections, recommendations, or suggestions in connection with the proposed changes to the Commissioner of Patents, Washington, D.C. 20231, before April 30, 1972. No oral hearing will be held. Any written comments or suggestions may be inspected by any person upon written request a reasonable time after the closing date for submitting comments.

These proposed rule changes are intended to facilitate the examination, microfilming, and printing of patent applications and patents.

When patents are printed, all complex chemical and mathematical formulas and tables appearing in the text must be specially hand set and then inserted into a space left on the composed page. The hand setting is expensive and results in many errors which must later be corrected by Certificates of Correction. The use of submitted camera copy for printing would be inexpensive and error free. Members of both the legal and scientific communities have indicated that errors in printing formulas and tables are a problem.

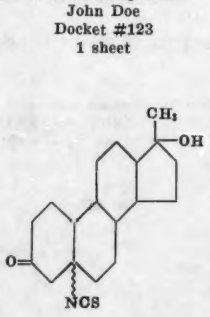
Under the proposed rules the applicant would furnish a copy of all tables and complex formulas, each having an identifying number, on bristolboard sheets or the like in a form suitable for use as camera copy for printing. The submitted specification would contain at the appropriate location either a copy of the insert plus its identifying number or the identifying number and a blank space. Although the applications would be submitted with the formulas and tables on sheets separate from the specification texts, the patents would continue to be printed with the formulas in the text.

The formulas and tables could be corrected and amended in the same manner as drawings.

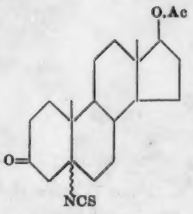
The following is an example of how a sheet of inserts might appear.

Chemical Composition
John Doe
Docket #123
1 sheet

Insert (1):



Insert (2):



Insert (3):

Imide of example	10/E speed	Gamma	Fog	Density	Printing rate
1	1.45	2.10	0.01	3.71	−38
3	2.7	2.46	.01	3.41	−6
4	1.8	2.02	.01	3.55	−20
5	3.15	2.38	.22	3.67	−6
6	2.10	2.00	.01	3.92	−18
7	1.95	2.22	.01	3.63	−26
9	2.2	2.10	.01	3.63	−18
10	1.85	1.78	.01	3.25	−38
11	1.85	2.06	.01	3.57	−29
12	2.95	2.36	.01	3.57	−6

Insert (4):

$$\frac{d}{dx}(\text{arc vers } v)=\frac{\frac{dv}{dv}}{2v-v^2}$$

Section 1.52, if amended as proposed, would require application papers in a form that would permit readily legible reproductions to be made and certified for use in foreign priority filings, court proceedings and 37 CFR 1.60 continuing applications.

The proposed changes are as follows:

1. Section 1.52 is revised to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The specification and oath or declaration must be in the English language. All papers which are to become a part of the permanent records of the Patent Office must be legibly written or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form which has sufficient contrast between paper and ink and of sufficient clarity to permit the production of readily legible copies in any number by photography, electrostatic processes, photo offset, and microfilming. Substitute typewritten or printed papers and inserts (see § 1.58) may be required if the papers and inserts originally filed are not of the required quality.

(b) The application papers (specification and claims, oath, declaration, papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly written on but one side of the paper. A wide margin must be reserved on the left-hand side and on the top of each page and the lines must not be crowded too closely together. The size of the sheets of paper should be 8 to 8½ by 12½ to 13 inches (20.3 to 21.6 cm. by 31.8 to 33.0 cm.), or international A4 (21 cm. x 29.7 cm.). Use of typewritten and double spaced lines with margins of 1½ inches on the left-hand side and top is deemed preferable. The pages of the specification, including those containing claims, should be numbered consecutively, starting with 1, the numbers being placed in the center of the bottom margins.

(c) Any interlineation, erasure, or cancellation or other alteration must have been made before the application was signed and sworn to or declaration made, and should be clearly referred to in a marginal note or footnote on the same sheet of paper, dated and initialed or signed by the applicant to indicate such fact. No such alterations are permissible after execution of the application papers. (See § 1.56)

2. A new § 1.58 is added to read as follows:

§ 1.58 *Chemical and mathematical formulas and tables.*

(a) The specification, including the claims, and the abstract may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification and the abstract may contain tables; a claim may contain tables only if necessary to conform to 35 U.S.C. 112.

(b) In the application specification, one-line formulas composed of normal sized Roman and Greek letters and Arabic numerals with one level of superiors and inferiors may appear in the text. All other tables and chemical and mathematical formulas must be presented separately from the specification on pure white paper as defined in § 1.84(a), for use as camera copy for insertion in the specification when printing any patent which may issue.

(c) The size of the separate insert sheets must be 8½ inches wide (21.6 cm.) by not more than 14 inches (35.6 cm.) or less than 10 inches (25.4 cm.) high. A space of at least 1 inch (2.54 cm.) in height must be left at the top of the sheet (the narrow dimension) for marking and fastening. The sheets may contain holes as defined in § 1.84(b) and identifying indicia as defined in § 1.84(1). Amendments may be made as provided for in § 1.123.

(d) All formulas and tables on the separate insert sheets should be consecutively numbered in the order in which they appear in the specification, and labeled at their upper lefthand corners with the word "Insert" before the number within parentheses (for example, "Insert (3)"). Formulas or tables which are to appear consecutively in a patent may be grouped and designated as a single insert. The location in the originally submitted specification where an insert is to appear in the printed patent should be indicated by a wide space and the appropriate insert designation.

(e) The width of such formulas and tables on the separate insert sheets should be limited normally to 5 inches (12.7 cm.). If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10¾ inches (27.3 cm.) and to place it sideways on the insert sheet, if necessary, in which case the insert will appear printed across both columns of the page in the printed patent. The characters used in such formulas and tables must be from a type font having capital letters which are at least 0.086 inches (2.2 mm.) high (elite type). On the separate insert sheets a space at least three-eighths inch (9.5 mm.) high should be provided between the numbered inserts.

(f) In addition to the separate insert sheets, reproduction copies of the formulas and tables may be placed in the specification at the locations where they are to be printed. Such copies should, however, be labeled with an insert designation as provided in paragraph (d) of this section.

§ 1.75 [*Amended*]

3. Section 1.75 is amended by adding at the end of paragraph (d)(1) the expression, "(See § 1.58(a).)"

ROBERT GOTTSCHALK,
Acting Commissioner of Patents.

Approved: January 19, 1972.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 72-1394; Filed 2-1-72; 8:45 a.m.]

Published in 37 FR 2520; Feb. 2, 1972

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,637,893, G. Shaw, ARTIFICIAL FILAMENT, **filed** Mar. 23, 1965, D.C. Vt. (Burlington), Doc. 4223, *Gilbert Shaw and Polymers, Inc.* v. *E. B. & A. C. Whiting Company.* Stipulated final order on mandate was filed and shall terminate the above action for all times, Dec. 2, 1970.

2,727,069, J. P. M. Van Waes, PREPARATION OF UREA, **filed** July 25, 1968, D.C. Del. (Wilmington), Doc. 3586, *Stamicarbon, N.V.* v. *Carolina Nitrogen Corporation et al.* Consent judgment, defendants have infringed, Sept. 20, 1971. **Same, filed** July 26, 1968, D.C. Del. (Wilmington), Doc. 3590, *Stamicarbon, N.V.* v. *Chemical Construction Corporation.* Consent judgment, patent valid and defendant has infringed and is permanently enjoined, Oct. 1, 1971. **Same, filed** Mar. 25, 1969, D.C. Del. (Wilmington), Doc. 3690, *Stamicarbon, N.V.* v. *Arkla Chemical Corporation.* Consent judgment, patent valid and infringed, Sept. 2, 1971.

2,761,178, Van Doorn and Pease III, OPERATING MECHANISM FOR GIN BREASTS AND MULTIPLE GIN SYSTEM, **filed** June 18, 1971, D.C., M.D. Ala. (Montgomery), Doc. 3355-N, *Lummus Industries, Inc.* v. *Continental/Moss-Gordin, Inc.* Case dismissed without prejudice, Sept. 13, 1971.

2,868,272, Poole and Poole, BABY SUPPORTER AND EXERCISER, **filed** June 14, 1971, D.C. Md. (Baltimore), Doc. 71-629-N, *Jolly Jumper Products of America, Limited* v. *Hutzler Brothers Company.*

2,918,420, R. C. Sabins, ELECTROLYTIC SYSTEM; **3,108,939,** same, PLATINUM PLUG-VALVE METAL ANODE FOR CATHODIC PROTECTION; **2,982,714,** same, ELECTROLYTIC SYSTEM; **3,362,900,** same, SYSTEM FOR CATHODICALLY PROTECTING A STRUCTURE; **2,998,371,** same, CONTROL SYSTEM; **2,934,485,** same, DEVICE AND ITS USE FOR PROTECTING ELEMENTS AGAINST GALVANIC DISSOLUTION; **3,054,743,** same, ELECTROLYTIC SYSTEM; **Reg. No. 673,493** (CATHANODE), Sabins-Dohrmann Co., **filed** Sept. 1, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-2098-JWC, *Selectro-Chem Company* v. *Lockheed Aircraft Corporation.*

2,934,485. (See 2,918,420.)

2,934,932, H. B. Wagner, HYDRAULIC CEMENT MORTAR COMPOSITIONS AND METHODS OF USE, **filed** Sept. 13, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-2187-FW, *Tile Council of America* v. *Continental Chemical Products of Los Angeles and John S. Schirm.*

2,942,429, Van Dolah and Patterson, POULTRY CHILLING; **3,092,975,** R. S. Zebarth, ARTICLE CHILLING METHOD AND APPARATUS; **3,240,026,** Van Dolah and Patterson, POULTRY CHILLING, **filed** Sept. 21, 1971, D.C., S.D. Ill. (Peoria), Doc. P-3286, *Swift & Company* v. *Archer Daniels Midland Company and Ralston Purina Company.*

2,944,639, W. T. Blake, SHOCK ABSORBER WITH VACUUM COMPENSATOR; **2,944,681,** same, RAILWAY DRAFT APPLIANCE, **filed** Dec. 16, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c3153, *Halliburton Company and William T. Blake* v. *Keystone Industries, Inc., formerly Keystone Railway Equipment Company, Inc.* Case ordered transferred to the Middle District of Pennsylvania, June 9, 1971.

2,944,681. (See 2,944,639.)

2,982,714. (See 2,918,420.)

2,998,371. (See 2,918,420.)

3,031,725, R. E. Omholt, FLOORING SYSTEMS, **filed** Sept. 24, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71-C-486, *Powerlock Systems, Inc.* v. *Duo-Lok, Inc. and Baseman Bros., Inc.*

3,054,743. (See 2,918,420.)

3,092,975. (See 2,942,429.)

3,096,148, W. Walker, Jr., ARTICLE STERILIZING, DEODORIZING AND ACCOUNTING PROCESS AND APPARATUS, **filed** Feb. 22, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71-C-196, *Willis Walker, Jr., M.D.* v. *C. R. Bard, Inc. and W. H. Andersen Products, Inc.* Stipulation of dismissal, Sept. 17, 1971.

3,108,939. (See 2,918,420.)

3,153,976, L. E. Linder, AMMUNITION RELOADING APPARATUS, **filed** Sept. 23, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-2286-CC, *Western Automatic Reloading Equipment, Inc. et al.* v. *Jose Rosan, Sr. et al.*

3,168,130, E. W. Turpin, WHEEL SUPPORTING AND TIRE DISMOUNTING APPARATUS; **3,267,977,** same, SUPPORT DEVICE FOR VEHICLE WHEELS, **filed** Sept. 11, 1971, D.C., S.D. Ohio (Cincinnati), Doc. 8126, *Big Four Automotive Equipment Corp.* v. *Harry J. Miller et al.*

3,210,767, D. W. Isbell, FREQUENCY INDEPENDENT UNI DIRECTIONAL ANTENNAS; **Re. 25,740,** Mayes and Carrel, LOG PERIODIC BACKWARD WAVE ANTENNA ARRAY; **3,259,904,** Blonder and Schenfeld, ANTENNA HAVING COMBINED SUPPORT AND LEAD-IN, **remanded** June 17, 1971, D.C., N.D. Ill. (Chicago), Doc. 66c567, *The University of Illinois Foundation* v. *Blonder-Tongue Laboratories, Inc.* v. *JFD*

Electronics Corporation. Judgment order entered on June 27, 1968 is vacated. Judgment order on remand, plaintiff is estopped to assert the validity of Pat. No. 3,210,767; Re. 25,740 is invalid; judgment on the amended complaint is entered for defendant, with prejudice; defendant is owner of 3,259,904, claim 5 is invalid, Sept. 27, 1971.

3,230,675, Frommelt and Frommelt, DOCK PADS WITH ADJUSTABLE HEAD PAD; **3,403,489,** same, LOADING DOCK SHELTERS, **filed** July 31, 1969, D.C., N.D.N.Y. (Utica), Doc. 69–CV–265, *Dubuque Awning & Tent Company* v. *W. B. McGuire Co., Inc.* Complaint dismissed with prejudice in respect of all claims, defendant recover from plaintiff its full costs incurred in defendant against said claims, judgment shall be final except that matters of defendant's rights to damages, to an injunction and to attorney fees, based on allegations in its answer and its counterclaims are reserved for future disposition by this court, Sept. 16, 1971.

3,234,123, J. N. Hinde, METHOD OF AND MEANS FOR TREATING BODIES OF WATER, **filed** Sept. 17, 1971, D.C., E.D. Ill. (Chicago), Doc. 71c2281, *Schramm, Inc.* v. *James Nelson Hinde and Hinde Engineering Co.*

3,240,026. (See 2,942,429.)

3,259,904. (See 3,210,767.)

3,267,507, P. E. Cox, CONDUCTOR WIRE CLEANING DEVICE, **filed** Sept. 7, 1971, D.C., M.D.N.C. (Greensboro), Doc. C–208–WS–71, *Paul E. Cox* v. *Graybar Electric Company, Inc.*

3,267,977. (See 3,168,130.)

3,296,636, B. Markwitz, BUOYANCY RING, **filed** Sept. 16, 1971, D.C. Colo. (Denver), Doc. C–3403, *Bernard Markwitz* v. *Ute Mountain Corporation.*

3,362,900. (See 2,918,420.)

3,399,833, A. C. W. Johnson, LOW INTENSITY RADIANT HEATER SYSTEM AND BURNER THEREFOR, **filed** June 8, 1971, D.C., E.D. Mich. (Detroit), Doc. 36609, *Combustion Research Corp.* v. *Charles L. Green, doing business as G & G Radiant Pro.*

3,403,489. (See 3,230,675.)

3,404,494, H. D. Wolfe, THEATRE AND STAGE CONSTRUCTION; **D. 201,618,** same, BUILDING, **filed** Aug. 21, 1971, D.C., S.D. W. Va. (Charleston), Doc. 71–182–CH, *First Barn Dinner Theatre, Inc.* v. *Walter H. Lewis, Jr.*

3,408,306, F. J. Boylan, METHOD OF CONTROLLING FOAMING, **filed** Oct. 29, 1968, D.C., N.D. Ga. (Atlanta), Doc. 12188, *Hercules Incorporated* v. *NOPCO Chemical Co., Inc.* Case dismissed and settled by parties, Mar. 18, 1971.

3,458,783, M. A. Rosenberg, HERMETICALLY SEALED CAPACITOR, **filed** Sept. 10, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2176–AAH, *San Fernando Electric Manufacturing Co., Inc.* v. *Erie Technological Products, Inc.*

3,506,326, A. V. Tantillo, HINGE MEANS, **filed** July 7, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1629, *General Bathroom Products Corp.* v. *Monarch Metal Products Corp.* Judgment for defendant; defendant's motion for summary judgment is denied. The court concludes that the patent issued to plaintiff is invalid by virtue of anticipation. 35 U.S.C. § 102(a) and (b).

3,533,407, G. I. Smith, STRAP TYPE WRIST SUPPORT, **filed** Sept. 17, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71–911, *King Louis International, Inc.* v. *House of Champions Research Laboratories, Inc.*

3,594,255, W. D. Budinger, HICKEY ROLLER AND METHOD, **filed** Sept. 20, 1971, D.C. Del. (Wilmington), Doc. 4227, *Rodel, Inc. and William D. Budinger* v. *National Plate Graniers, Inc.*

3,598,088, Bowman, Bowman and Moeller, LIVESTOCK DIP APPARATUS, **filed** Sept. 27, 1971, D.C., W.D. Okla. (Oklahoma City), Doc. 71–621–C, *Jim H. Bowman et al.* v. *Lloyd Lanier et al.*

Re. 25,740. (See 3,210,767.)

Re. 25,899, A. J. Waibel, HIGH PRESSURE VALVE ASSEMBLY, **filed** Sept. 27, 1971, D.C. W.D.N.Y. (Buffalo), Doc. C–1971–426, *Ingersoll-Rand Company* v. *Dresser Industries, Inc.*

D. 199,291, F. J. Jahn, DISPLAY STAND FOR PHOTOGRAPHS AND THE LIKE, **filed** Oct. 1, 1971, D.C. Conn. (Bridgeport), Doc. B–374, *Textron, Inc., Eaton Paper Company, Div.* v. *Zell Company and Charles Zell.*

D. 201,618. (See 3,404,494.)

D. 209,499, C. L. Leavitt, BOBBIN HOLDER, **filed** Aug. 26, 1969, D.C., S.D.N.Y., Doc. 69–3718, *Reynolds Industries Inc.* v. *W. H. Collins Inc.* Stipulation of dismissal pursuant to Rule 41(a), Sept. 14, 1971.

D. 220,728, J. G. Cox, Jr., BOW-MOUNTED STEERING CONSOLE FOR BOATS, **filed** Aug. 30, 1971, D.C., E.D. Tex. (Tyler), Doc. 5351, *Joseph G. Cox, Jr.* v. *Arrowglass Boat & Manufacturing Corporation and Black Boat & Motor Company, Inc.*

D. 221,219, T. Winrow, SOFA, **filed** Aug. 20, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2049, *Futorian Corporation* v. *David Fitchmun & Associates, Inc.*

Reg. No. 673,493. (See 2,918,420.)

Certificates of Correction for the Week of Feb. 29, 1972

Re. 27,171	3,583,428	3,598,204	3,603,615
D. 222,013	3,583,969	3,598,335	3,603,653
3,317,369	3,584,037	3,598,336	3,603,937
3,328,349	3,587,314	3,598,918	3,603,969
3,328,961	3,587,902	3,599,154	3,604,015
3,484,484	3,587,936	3,599,505	3,604,254
3,493,857	3,588,321	3,599,617	3,604,257
3,514,293	3,588,420	3,599,722	3,604,397
3,526,918	3,588,442	3,599,871	3,604,646
3,533,876	3,589,007	3,600,015	3,604,812
3,533,942	3,591,002	3,600,509	3,605,186
3,542,230	3,591,563	3,600,620	3,605,455
3,542,963	3,591,593	3,600,640	3,605,705
3,545,719	3,591,927	3,600,669	3,607,398
3,552,350	3,592,109	3,600,773	3,607,528
3,555,082	3,592,637	3,600,852	3,607,597
3,557,762	3,592,685	3,600,864	3,607,653
3,558,367	3,592,856	3,601,074	3,607,790
3,559,901	3,593,384	3,601,283	3,607,914
3,562,064	3,594,371	3,601,367	3,607,978
3,562,281	3,594,603	3,601,674	3,608,028
3,563,970	3,594,743	3,602,018	3,609,056
3,563,981	3,594,747	3,602,135	3,609,360
3,563,988	3,594,766	3,602,205	3,610,666
3,572,058	3,594,865	3,602,234	3,610,776
3,573,527	3,595,010	3,602,317	3,611,751
3,574,555	3,595,070	3,602,700	3,613,211
3,576,737	3,596,174	3,602,890	3,613,465
3,577,314	3,596,221	3,603,136	3,615,025
3,578,594	3,597,250	3,603,440	3,615,082
3,578,904	3,597,661	3,603,486	
3,579,532	3,598,102	3,603,605	

Dedications

2,963,398.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Dec. 6, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

3,600,319.—*Burton H. Gedge III*, Wyoming, and *Charles H. Brain*, Mount Healthy, Ohio. PROCESS FOR APPLICATION OF ENZYMES TO SPRAY-DRIED DETERGENT GRANULES. Patent dated Aug. 17, 1971. Dedication filed Nov. 5, 1971, by the assignee, *The Procter & Gamble Company*.

Hereby dedicates to the Public the entire remaining term of said patent.

2,990,318.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated June 27, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,990,319.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated June 27, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,995,487.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and Berton C. Dickinson, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Aug. 8, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

Patents Available for Licensing or Sale

3,578,566. PROCESS OF TREATING OIL CONTAINING FERMENTATION DISCHARGES. Deutsche Akademie der Wissenschaften zu Berlin, East Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,584,437. IMPROVED DEVICE FOR CONTROLLING HORSES. Raymond N. Boyington, Star Route, Milford, Maine, 04461.

3,604,993. SPEED CONTROL SYSTEM FOR CONVEYING MACHINE ENERGIZED BY THREE-PHASE CURRENT. Erich Volkert et al., Efurt, Germany. Correspondence to: Elton Industries, Inc., 420 Jericho Turnpike, Jericho, N.Y., 11753.

3,609,890. ELECTRIC STEAM IRON. Carlos S. Abraham, Mexico City 1, Mexico. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,619,557. DEVICE FOR FACILITATING REMOVAL OF ASPHALT TILE. Lawrence D. McClure, 140 Zartop St., Oakley, Calif., 94561.

3,623,749. PORTABLE BICYCLE. Falle R. Jensen, 44 W. Del Amo Blvd., Long Beach, Calif., 90805.

The Department of Health, Education, and Welfare is offering the following 5 patents for licensing as provided by Title 45 C.F.R. Section 6.3.

Inquiries should be addressed to: Norman J. Latker, Chief, Patent Branch, % National Institutes of Health, Room 5A03, Westwood Bldg., Bethesda, Md., 20014.

3,617,344. NONTHROMBOGENIC PLASTIC SURFACES AND PREPARATION THEREOF.

3,635,889. ADHESION PROMOTING DENTAL MATERIALS.

3,637,677. NITROSOAMINES.

3,637,695. SYNTHESIS OF HOMOPTERAIC AND HOMOFOLIC ACID.

3,304,990. EXPLOSION PROOF CENTRIFUGAL EVAPORATOI WITH MAGNETIC DRIVE.

General Electric Company is prepared to grant non-exclusive licenses under the following 44 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: General Electric Company, Control and Drives Automation Business Division, 3001 East Lake Road, Erie, Pa., 16501. Attention: Patent Counsel.

2,896,100. ELECTRODYNAMIC MACHINE.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa., 19101.

3,560,847. APPARATUS AND PROCESS FOR DETECTING LIVE BACTERIA.

Applications for license under the following patent may be addressed to: Patent Counsel, Communication Systems Business Division, General Electric Company, Waynesboro, Va., 22980.

3,609,219. SYSTEM FOR REGULATION OF COLOR TELEVISION CAMERA SIZE AND CENTERING CURRENTS.

Applications for license under the following 2 patents may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,614,693. LIQUID COOLING OF ELECTRICAL APPARATUS.

3,617,606. SHIELDED BUSHING CONSTRUCTION.

Applications for license under the following 4 patents may be addressed to: Patent Counsel, Data Communication Products Department, General Electric Company, Waynesboro, Va., 22980.

3,569,944. METHOD OF OPTICAL RECORDING OF BINARY CODES.

3,615,325. METHOD OF MAKING A SLEEVE-TYPE METAL TO GLASS TO METAL TO METAL SEAL.

3,621,112. HOUSING FOR ELECTRICAL COMPONENTS.

3,621,174. LUBRICATIVE ATMOSPHERE FOR SEALED SWITCHES.

Applications for license under the following 9 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,467,458. REFRIGERATION INNER DOOR CONSTRUCTION.

3,592,771. TUBULAR HEATING ELEMENTS AND MAGNESIA INSULATION THEREFOR AND METHOD OF PRODUCTION.

3,593,544. AUTOMATIC CLOTHES DRYER TO HEAT SHRINK TRANSFER AGENT USED TO CLEAN FABRICS.

3,595,036. DISPENSER FOR TREATING CHEMICAL.

3,603,631. PUSH TO RELEASE LATCH FRICTION TYPE.

3,612,827. FLAT PLATE SURFACE HEATING UNIT.

3,613,656. PYROLYTIC CLEANING OF DOUBLE OVENS.

3,618,335. AUTOMATIC ICEMAKER.

3,622,478. CONTINUOUS REGENERATION OF FERRIC SULFATE PICKLING BATH.

Applications for license under the following 13 patents may be addressed to: Patent Counsel, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

3,275,358. GLASS-TO-METAL AND GLASS-TO-CERAMIC SEALS.

3,275,359. GLASS COMPOSITION FOR HERMETIC SEALS.

3,314,893. GROUP II METAL-THORIUM PHOSPHATE PHOSPHORS.

3,335,084. METHOD FOR PRODUCING HOMOGENEOUS CRYSTALS OF MIXED SEMICONDUCTIVE MATERIALS.

3,351,436. PREPARATION OF THORIUM PYROPHOSPHATE.

3,361,678. SILICON CARBIDE LUMINESCENT MATERIAL.

3,374,179. GREEN EL ZINC SULFIDE PHOSPHOR.

3,379,502. SINGLE CRYSTAL PHOSPHIDE PRODUCTION.

3,389,089. BLUE ELECTROLUMINESCENT PHOSPHOR AND METHOD FOR ITS PRODUCTION.

3,396,307. TRANSISTOR INVERTER LAMP BALLASTING CIRCUIT.

3,470,107. SILICON CARBIDE PHOSPHORS.

3,541,018. INFRARED-EXCITABLE YTTERBIUM SENSITIZED ERBIUM OR THULIUM ACTIVATED RARE EARTH FLUORIDE LUMINESCENT MATERIAL.

3,541,022. INFRARED EXCITABLE YTTERBIUM SENSITIZED ERBIUM ACTIVATED RARE EARTH OXYSULFIDE LUMINESCENT MATERIAL.

Applications for license under the following 13 patents may be addressed to: Patent Counsel Contractor Equipment Business Division, General Electric Company, 1285 Boston Ave., Bldg. 21 ES, Bridgeport, Conn., 06602.

2,942,223. ELECTRICAL RESISTANCE HEATER.

2,958,121. METHOD OF FORMING INTEGRAL FINNED SHEATHED HEATERS.

2,964,307. SEALING MEANS.

3,045,095. PRINTED WIRING BOARD REPAIR APPARATUS.

3,066,210. POWER OSCILLATOR.

3,066,264. POWER AMPLIFIER.

3,154,669. ELECTRIC HEATER AND SUPPORT ASSEMBLY.

3,259,993. APPARATUS AND METHOD FOR TREATING STRIP.

3,304,408. ELECTRIC HEATING DEVICES.

3,348,021. ELECTRIC HEATER ASSEMBLY FOR A SAUNA ROOM.

3,351,329. WIRE COATING OVEN APPARATUS.

3,509,835. COMBINED FILTER-INCINERATOR DEVICE FOR WASTE DISPOSAL SYSTEM.

Disclaimers

Re. 26,910.—*Martin L. Klein*, San Clemente, *Harry C. Morgan*, Anaheim, and *Richard B. Rush*, Granada Hills, Calif. HIGH SPEED DATA CONVERSION AND HANDLING. Patent dated June 23, 1970. Disclaimer filed Nov. 19, 1971, by the assignee, *North American Rockwell Corporation*.

Hereby enters this disclaimer to claims 6, 8, 18, 19 and 22 of said patent.

3,336,707.—*William J. Horgan, Jr.*, Pittsburgh, Pa. STRUCTURAL GASKET CURTAIN WALL. Patent dated Aug. 22, 1967. Disclaimer filed Nov. 26, 1971, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,402,007.—*Erwin Gerlach*, Stockholm, Sweden. FILM FEEDING MECHANISM. Patent dated Sept. 17, 1968. Disclaimer filed Nov. 8, 1971, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to claims 16 and 21 of said patent.

3,406,526.—*Dudley T. Lusk*, Westmont, Ill. DOUBLE WALLED CRYOGENIC VESSEL. Patent dated Oct. 22, 1968. Disclaimer filed Nov. 12, 1971, by the assignee, *Chicago Bridge & Iron Co.*

Hereby enters this disclaimer to claims 1, 2, 3, 6 and 7 of said patent.

3,552,470.—*Frederick S. Metcalfe*, Columbus, Ohio. ROOM AIR CONDITIONER MOUNTING ARRANGEMENT. Patent dated Jan. 5, 1971. Disclaimer filed Nov. 10, 1971, by the assignee, *Westinghouse Electric Corporation*.

Hereby enters this disclaimer to all of the claims of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 8, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-06-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-04-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-23-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-25-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-10-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	6-08-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-20-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-03-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-04-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-04-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-04-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	1-06-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	12-08-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	2-11-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-04-71

Expiration of patents: The patents within the range of numbers indicated below expire during February 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,700,764 to 2,702,900, inclusive
Plant Patents..... Numbers 1,345 to 1,354, inclusive

REISSUES

FEBRUARY 29, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

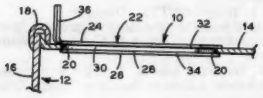
27,301
CAN CLOSURE PLUG

Robert S. Lutzker, Scarsdale, N.Y., assignor of thirty-three and one-third percent to Lawrence D. Lutzker, Scarsdale, N.Y.

Original No. 3,445,030, dated May 20, 1969, Ser. No. 711,557, Mar. 8, 1968. Application for reissue Feb. 6, 1970, Ser. No. 9,141

Int. Cl. B65d *43/10*

U.S. Cl. 220—60 11 Claims



A closure for sealing a can opening defined in the top end wall of the can comprising a substantially resilient member which is provided with a peripheral groove of decreasing depth from front to rear. The front portion is slid into place with the edge walls of the opening received in the groove. The decreasing depth of the groove facilitates snapping the remainder of the member into place to seal the opening.

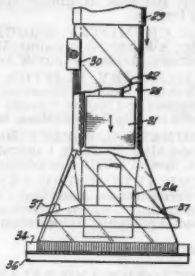
27,302
METHOD OF MAKING DISPENSING CONTAINERS

William S. Schneider, Glendale, and Arthur P. Corella, Hollywood, Calif., assignors of eleven and one-quarter percent to Wayne V. Rodgers, South Pasadena, Calif., and ten percent to Carl Schneider, Peninsula, Calif.

Original No. 3,552,087, dated Jan. 5, 1971, Ser. No. 650,077, June 29, 1964, which is a division of Ser. No. 391,130, Aug. 21, 1964. Application for reissue July 15, 1971, Ser. No. 159,146

Int. Cl. B65b *9/06*

U.S. Cl. 53—28 34 Claims



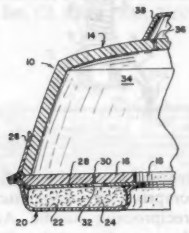
The method involves making a "stand-up" package from flexible film of the heat sealable variety, by crushing and flattening one end of a tube and then thermally molding or setting the film to form stiffened, self-sustaining folds.

PATENTS

GRANTED FEBRUARY 29, 1972

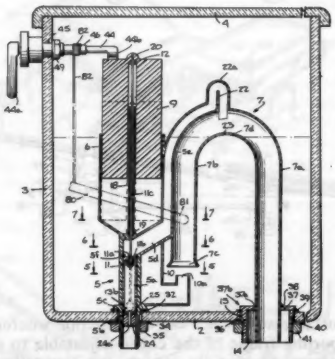
GENERAL AND MECHANICAL

3,644,939
AIR DAMPED HEARING PROTECTOR EARSEAL
Fred P. Beguin, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Oct. 12, 1970, Ser. No. 80,064
Int. Cl. A41d *1/06*
U.S. Cl. 2—209 **5 Claims**

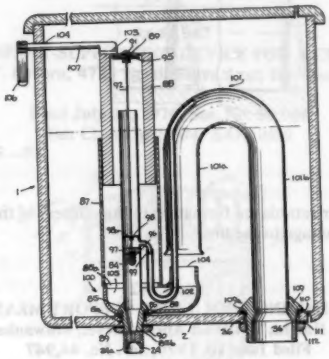


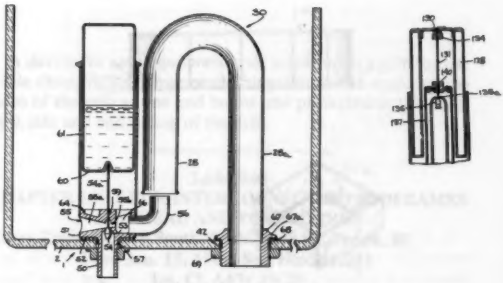
A hearing protector earcup having an earseal in the form of an annular envelope of highly flexible plastic sheet material held tightly against a rigid inwardly directed flange of the earcup. Capillary holes are provided through the rigid earcup flange in communication with larger openings in the envelope of the earseal wherewith airflow through the capillary orifices, into and from the earseal envelope, is exploited to achieve greater wearing comfort and strong damping of vibrations of the earcup resulting from excitation by ambient low-frequency sound waves. An additional small opening through an outer wall of the cup vents its interior.

3,644,940
FLUSHING DEVICE
Vernon D. Roosa, 184 Wood Pond Road, West Hartford, Conn.
Filed July 8, 1970, Ser. No. 53,170
Int. Cl. E03d *1/10*
U.S. Cl. 4—47 **26 Claims**



A flushing device for toilets having a float directly connected to the movable part of an inlet valve to form a unitary moving element. A siphon empties the flush tank and becomes inactive until a full tank is flushed again. When the float, which is slidably mounted in a chamber, is forced down for flushing, it forces water from the float chamber into the siphon either alone or with water from the inlet valve, to start a siphoning action to empty the flush tank. At the same time the float opens the inlet valve to supply additional water to start the siphon and to keep the valve open until the flush tank is refilled at which time the float has been raised to its



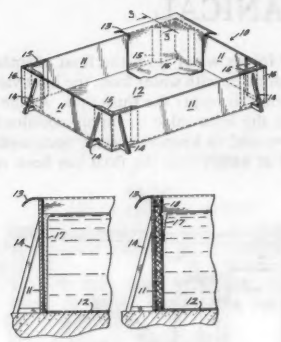


normal position. Provisions are made for preventing a reverse flow from the tank into the inlet pipe during failure of the water supply and for filling the toilet bowl to the desired level at the end of the flushing operation. Provision is also made for conserving water by flushing a predetermined quantity of water for solids and considerably less water for liquids and by providing means for regulating the amount of water to be flushed by the flushing unit.

3,644,941
SWIMMING POOL LINER
Ralph L. Kuss, Findlay, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio
Filed Dec. 3, 1970, Ser. No. 94,871
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 **11 Claims**

An aboveground swimming pool having rigid sidewalls, vertical corners, and a flexible plastic liner. Each corner of

the liner has a thermal barrier interjacent the liner and the sidewalls, extending the vertical height of the pool. The thermal barrier retards ice formation in the corners of the pool to prevent damage to the liner.



3,644,942

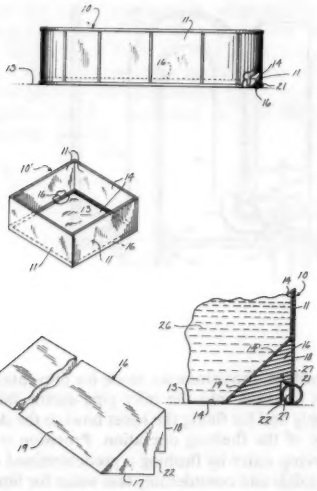
SWIMMING POOL LINER SUPPORT MEANS

Donald C. Haight, 174 West Allerton Ave., Milwaukee, Wis.

Filed June 10, 1970, Ser. No. 44,947

Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.19 **17 Claims**



A preformed liner support or so-called filler device of triangular cross section which is designed for fast and easy installation in an above-the-ground swimming pool or other pool utilizing a flexible plastic water-retaining liner. Said triangular filler device is positioned on the ground along the bottom of the pool sidewalls, within the pool interior, and is designed to provide support means for the lower portion of said plastic liner to prevent the same from being ruptured by the weight of the water in the pool, as well as eliminating the possibility of water pressure forcing said liner beneath the bottom edge of said pool sidewalls.

3,644,943

DEVICE FOR CLEARING BLOCKAGES IN THE OUTLETS OF SINKS, BATHS OR THE LIKE

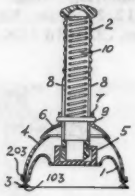
Giuseppe Parodi fu Leonardo, and Giuseppe Perodi di Francesco, both of 5/2 Via Benedetto da Cesino, Genoa, Italy

Filed Dec. 31, 1968, Ser. No. 788,301

Claims priority, application Italy, Jan. 4, 1968, 829,420

Int. Cl. E03d *5/09*

U.S. Cl. 4—255 **2 Claims**



A device for clearing blockages in the outlets of sinks, baths or the like comprises an elastomeric cup to the base of which is fixed a reciprocable handle. An annular pressing member engages the cup adjacent the rim and acts between the rim and the base of the cup or between the rim and the handle to bias the cup to its expanded condition so that in use the rim is held in engagement with the bottom of the bath or the like as the handle is reciprocated.

3,644,944

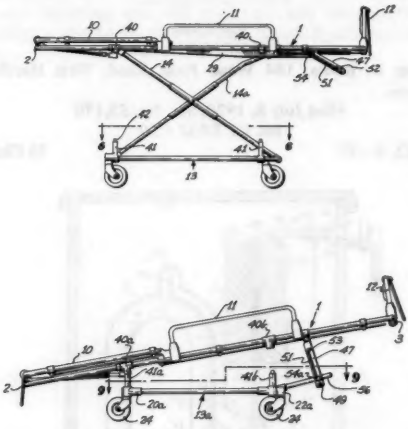
AMBULANCE COT CONSTRUCTION

Elroy E. Bourgraf, Cincinnati, and Kenneth R. Self, Washington, both of Ohio, assignors to Ferno-Washington, Inc., Greenfield, Ohio

Filed May 20, 1970, Ser. No. 39,044

Int. Cl. A61g *1/02, 7/10*

U.S. Cl. 5—62 **9 Claims**



An adjustable ambulance cot construction wherein the patient-supporting frame of the cot is adjustable to effect the Trendelenburg position in which the patient's feet are elevated relative to the head, the cot frame being pivotally movable relative to one end of the undercarriage or other support on which the cot frame is mounted, the cot frame being releasably held in the elevated position by means of spring-biased slotted arms interconnecting the cot frame and a portion of the undercarriage, the arms being movable from an extended to a retracted position, thereby raising and

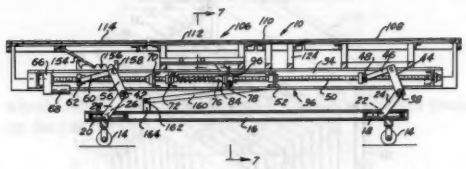
lowering the foot end of the cot. The invention is applicable to elevating and nonelevating types of cots, and in the former case contemplates an improved undercarriage which enables the entire cot frame to be raised or lowered irrespective of whether the cot frame is in a horizontal position or in the Trendelenburg position.

3,644,945

ADJUSTABLE HOSPITAL BEDS

Robert Goodman, Philadelphia, and David G. Kilpatrick, Bala Cynwyd, both of Pa., assignors to Goodman Brothers Manufacturing Company, Philadelphia, Pa.

Filed Dec. 31, 1969, Ser. No. 889,545
Int. Cl. A61g *7/00, 7/10*
U.S. Cl. 5—63 **9 Claims**



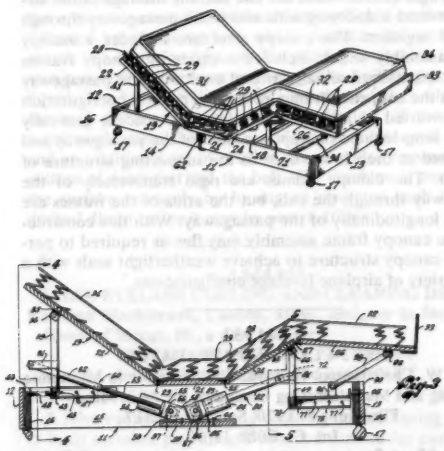
An adjustable bed of the so-called "hospital type" which may optionally be vertically or angularly adjusted as a unit and which is provided with a bedspring having articulated sections which are relatively angularly adjustable. The bed is provided with electrical control means for all the adjustments which may selectively be operated either by the nurse or other attendant or by the patient occupying the bed. This control means is provided with an electrical network, which is so constructed that it eliminates any possibility of electrical discharge which may cause a shock to the operator or which may cause a flammable spark.

3,644,946

ADJUSTABLE BED

Leonard W. Swatt, Los Angeles, Calif., assignor to Acme Spring Company, Los Angeles, Calif.

Filed May 15, 1970, Ser. No. 37,722
Int. Cl. A61g *7/00, 7/10*
U.S. Cl. 5—68 **12 Claims**



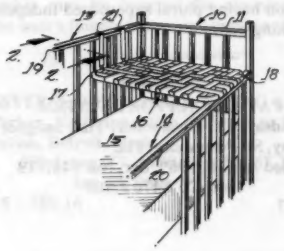
An adjustable bed comprising a rectangular frame on which are mounted rigid bedboard sections supporting a coil spring directly thereon. The bedboard comprises a stationary seat section mounted on the frame, and head and thigh sections pivoted at fixed points relative to the frame and seat section and tiltable relative thereto. A foot section is pivoted to the thigh section for relative rotative movement therebetween. The foot section is connected to the frame by pivoted levers and the head and thigh sections have lever arms pivotally mounted thereon at one end and carrying rollers at their opposite ends mounted on trackways on the frame. Separate motor actuators individually rotate the arms pivotally mounted on the head and thigh bedboard sections to tilt them as the rollers ride on the trackways on the frame. The actuators are individually operated in opposite directions to adjust the bed by manual control.

3,644,947

INFANT-SUPPORTING DEVICE FOR A CRIB

Robert F. Padera, 4725 North Sayre Ave., Harwood Heights, Ill.

Filed July 24, 1970, Ser. No. 58,086
Int. Cl. A63g *23/04;* **A47d** *9/00*
U.S. Cl. 5—92 **1 Claim**



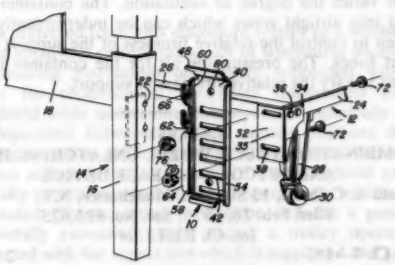
A device for safely supporting an infant upon a crib for use while changing its diaper or clothing, the device spanning the sides of the crib at one end below and protected at two sides by a side and end railing of the crib.

3,644,948

ADAPTER UNIT FOR INTERCONNECTING BEDFRAMES AND HEAD AND FOOTBOARDS

Harry Fredman, 908 South Washington St., Peoria, Ill.

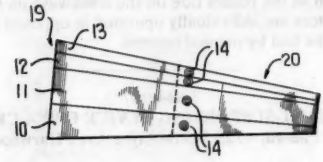
Filed Jan. 15, 1969, Ser. No. 791,241
Int. Cl. A47c *19/02*
U.S. Cl. 5—296 **4 Claims**



An adapter unit in the form of a slotted bracket for attachment to a bedframe in a horizontally and vertically adjusted position with upwardly projecting hooks thereon for engagement under the conventionally provided pins on a headboard and with cooperating bearing surfaces to stabilize and rigidify the engagement. The adapter unit is constructed

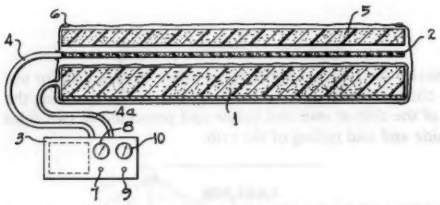
for mounting selectively at either side of the bedframe for various-size bedding and is capable of adapting to the varying widths of headboards.

3,644,949
MULTIPLE INFLATABLE PILLOW
Jack Diamond, 5135 Wissioming Road, Washington, D.C.
Filed June 17, 1970, Ser. No. 47,090
Int. Cl. A47g 9/00; A47c 27/08
U.S. Cl. 5—338 1 Claim



An air cushion having plural superposed independently inflatable cushioning pads.

3,644,950
PATIENT SUPPORT SYSTEM
Edward R. Lindsay, Jr., Clearwater, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.
Filed Aug. 1, 1969, Ser. No. 846,719
Int. Cl. A47c 27/08
U.S. Cl. 5—347 5 Claims

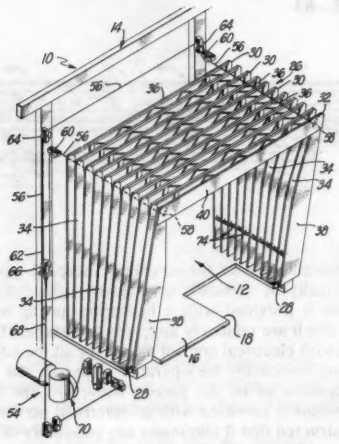


In a bed for supporting and treating a hospital patient, a lamination of low and medium density plastic foam is enclosed in a pressurized container. An open pore foam layer on top of the container produces a flow of air from the top of the foam layer for patient ventilation. Control of the volume of air varies the degree of ventilation. The container is divided into airtight zones which can be independently pressurized to control the relative firmness of the support in different zones. The pressurizing air for the container is controlled to vary the relative firmness of support.

3,644,951
COMBINATION TRUCK WHEEL UNLATCHING HOOK AND PETCOCK RELEASE DEVICE
Donald A. Colburn, 13 State St., Manchester, N.Y.
Filed Feb. 26, 1970, Ser. No. 885,625
Int. Cl. B25f 1/04
U.S. Cl. 7—1 G 2 Claims

An extension rod device for unlatching and pulling the lever on a trailer truck's fifth wheel without getting the user's clothes dirty. This device also includes a slotted end for engaging the air tank petcock in order to release therefrom.

3,644,952
CANOPY FRAME ASSEMBLY FOR CAB OF AIRPLANE LOADING AND UNLOADING RAMP
Gerald S. Hatch, South Ogden, Utah, assignor to Stanray Corporation, Chicago, Ill.
Filed July 29, 1970, Ser. No. 59,130
Int. Cl. B65g 11/00
U.S. Cl. 14—71 9 Claims

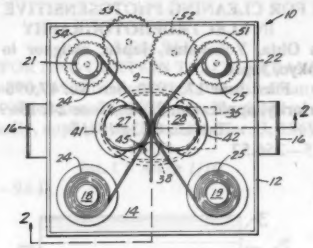


A passenger loading and unloading ramp, bridge, tunnel, gangway or conveyance for airplanes provided at its outer end with a cab having a flexible canopy structure providing a weathertight seal between the cab and the fuselage of the airplane around a doorway with which the passageway through the cab registers. The canopy structure includes a canopy frame assembly which includes a series of canopy frames spaced-apart longitudinally of and enclosing the passageway through the cab, each frame having the general configuration of an inverted U and including laterally spaced, generally upright arms located on opposite sides of the passageway and connected at their lower ends to the supporting structure of the cab. The canopy frames are rigid transversely of the passageway through the cab, but the arms of the frames are flexible longitudinally of the passageway. With this construction, the canopy frame assembly may flex as required to permit the canopy structure to achieve weathertight seals with a wide variety of airplane fuselage configurations.

3,644,953
SHEET-CLEANING APPARATUS
Robert W. Christiansen, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed June 8, 1970, Ser. No. 44,317
Int. Cl. B08b 11/00
U.S. Cl. 15—1.5 7 Claims

An inexpensive manually operated device for thoroughly cleaning photographic film negatives. The device includes two pneumatically inflated cylinders that press two lengths of wiping cloth into even and intimate contact with opposite

surfaces of a negative passed between the lengths of cloth. The device blows ionized air across the negative after it is wiped clean to neutralize any static electrical charges present on the negative.

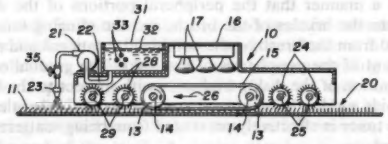


3,644,954

APPARATUS FOR TREATING SYNTHETIC TURF

Richard D. LeGrand, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 24, 1970, Ser. No. 75,052
Int. Cl. A47l *11/18*
U.S. Cl. 15—50 C 8 Claims



Apparatus is provided for rejuvenating artificial turf surfaces in which the pile lay has become unacceptable. Briefly, the apparatus comprises means to spray liquid on the surface followed by a moving belt, which contacts the surface and moves in a direction opposite the pile lay and which is heated to a temperature at least as high as the boiling point of the liquid. The belt is followed by rotatable brushes which buff the turf surface. As an additional feature, if the surface requires cleaning, the liquid employed is a detergent solution and an additional set of brushes are provided between applications of detergent and the belt. The machine is passed over the surface manually by having an operator push it in the desired direction, or it may be power driven.

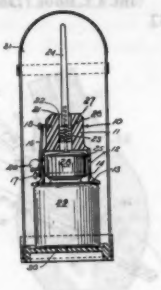
3,644,955

FALSE EYELASH CURLING AND CLEANING DEVICE

Kathleen Mackiernan, Canton, Mass., assignor to Stephen T. Goode, Chicago, Ill., a part interest

Filed Mar. 22, 1971, Ser. No. 126,401
Int. Cl. B08b *11/02*; A45d *2/48, 44/18*
U.S. Cl. 15—104.92 6 Claims

A false eyelash curling and cleaning device having a unitary body member providing a rounded surface for curving the base thread portion of a pair of false eyelashes, with a curved rim for curling the lashes proper, a cord for holding the eyelashes during storage and cleaning, said body member having means for removably housing a brush and for positioning a bottle containing cleaning fluid, and a base cup for holding the cleaning fluid into which the eyelashes on the body member may be lowered for cleaning and brushing without the user's fingers being immersed in the liquid.

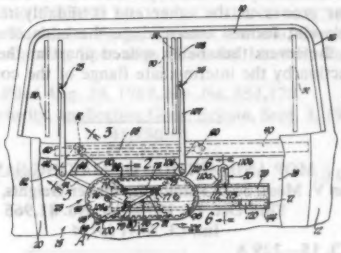


3,644,956

TRANSVERSE WINDSHIELD-WIPING APPARATUS

Eric C. Parker, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1970, Ser. No. 67,363
Int. Cl. B60s *1/32, 1/44*
U.S. Cl. 15—250.16 3 Claims



In a preferred form, this disclosure relates to a windshield-wiping apparatus comprising a pair of windshield wipers and an actuating mechanism operatively connected with the wipers for reciprocating the latter transversely of the windshield while maintaining the wipers in a generally vertical disposition between first and second positions during running operation and for moving the wipers between a park position adjacent the lower edge of the windshield and its generally vertical run position when operation is initiated and terminated. The actuating mechanism includes a generally horizontally extending guide means, a trolley operatively connected with the wipers and which is supported and guided for reciprocable movement in opposite directions through a first path by the guide means during running operation, and a parking means including an auxiliary guide means extending transversely of the main guide means for guiding the trolley for movement through a second path to cause the wipers operatively connected therewith to be moved from their generally vertical run position toward their park position when operation is being terminated.

3,644,957

WINDSHIELD WIPER BLADE

Raymond A. Deibel, West Falls, and William C. Riester, Williamsville, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed May 20, 1970, Ser. No. 39,010
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.42 3 Claims

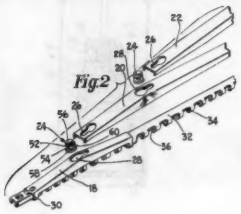


Fig. 2

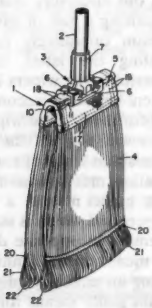
A windshield wiper blade includes a pressure-distributing frame having a series of levers arranged in partially overlapping relationship flexibly connected together; a lower articulating frame member retained by claws disposed at the free ends of adjacent lever members retains a rubber flexible blade interlocked with a blade-receiving seat in the lower frame member. Primarily for cold weather use the frame is enclosed by a rubber weather-protecting hood interlocked with the lower frame member and the rubber blade. An arm-attaching element is secured to the upper side. The lever members are connected together with a plastic or other non-metallic substantially cylindrically shaped connector; the connector includes annular grooves adjacent each end which form a head at each end and a spacing flange intermediate the ends. The annular groove at one end of the connector is received in a keyhole slot adjacent an end of the lever. The annular groove at the other end is slidably received in a keyhole slot formed intermediate the ends of an adjacent lever, the levers thus being spaced apart at their points of connection by the intermediate flange of the connector element.

3,644,958

MOP AND METHOD OF MAKING SAME

Theron V. Moss, 3175 Falmouth, Shaker Heights, Ohio

Filed Oct. 19, 1970, Ser. No. 81,965
Int. Cl. A47l *13/24*
U.S. Cl. 15—229 A 14 Claims



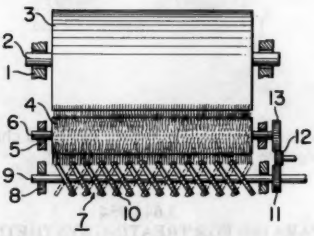
A mop having a relatively long fabric headband, and a pair of transverse members, preferably pieces of twine, disposed underneath the outer layer of headband material equally spaced on opposite sides of the transverse centerline of the headband which aid in securing the headband to a mop handle.

3,644,959

DEVICE FOR CLEANING PHOTOSENSITIVE MEMBER IN ELECTROPHOTOGRAPHY

Wasaburo Ohta, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed June 17, 1970, Ser. No. 47,098
Claims priority, application Japan, June 24, 1969, 44/60108
Int. Cl. G03g *15/16*
U.S. Cl. 15—256.52 9 Claims



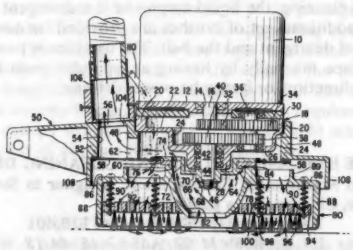
A device for cleaning or removing the toner particles which cling to photosensitive cylinders used in electrophotographic processing, comprising a rotating cleaning brush for removing the clinging toner particles from the photosensitive cylinder and means for in turn, cleaning the toner from the brush comprising a rotating shaft having a plurality of disks arranged thereon at angles to the rotational axis of the shaft in such a manner that the peripheral portions of the disks enter into the bristles of the brush, and the clinging toner is removed from the brush by the combined rotational and axial movement of the peripheries of the disks. The gradual oscillating motion of the disk peripheries with respect to the bristles avoids sudden bending and springback of the bristles so that the toner is effectively prevented from being scattered or dispersed.

3,644,960

FLOOR-CLEANING AND RUG-SHAMPOOING APPARATUS

Stanley Danzig, 4 Center St., Cresskill, N.J.

Filed May 21, 1970, Ser. No. 39,429
Int. Cl. A47l *11/30*
U.S. Cl. 15—322 7 Claims



A surface-cleaning and rug-shampooing apparatus of the type wherein rotating cleaning and shampooing brushes are spaced by spiral wipers that direct the brushed-off material to the inlet of an air suction conduit at the center of the rotating brushes wherein the conduit consists of an open-ended chamber at the center of a rotating brush housing that com-

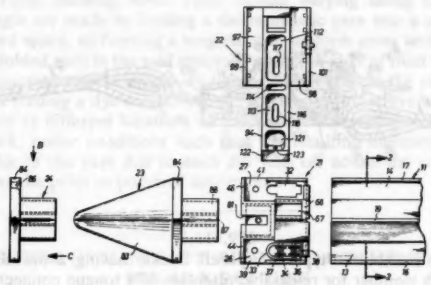
municates with a stationary housing formed with an outlet for connection to a suction pump. The stationary housing supports a motor and encloses a gear casing connecting a motor shaft to a driven shaft on which the brush housing is secured, and provides a passage between the chamber and the suction outlet therein.

3,644,961

SELF-SUPPORTING CURTAIN TRACK ARRANGEMENT

Wilhelm Hachtel, 6994 Niederstetten, West Germany

Filed Jan. 28, 1970, Ser. No. 6,411
Claims priority, application Germany, Mar. 3, 1969, P 19 10 680.0
Int. Cl. A47h *1/10*
U.S. Cl. 16—94 D 29 Claims



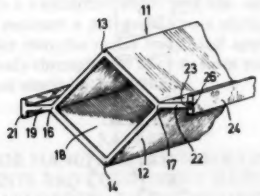
A track for curtain slides or rollers is made extremely rigid by vertical ribs extending from its top and bottom. It supports the slides or rollers by horizontal wings extending from its sides. Supporting arms extend from a wall and have downward directed dovetail ends which engine in complementing dovetail grooves in an intermediate member secured at the end of the track. A closing member is secured to the other end of the intermediate member for carrying a decorative end portion or for attaching the track to a wall.

3,644,962

CURTAIN ROD

Wilhelm Hachtel, 6994 Niederstetten, Germany

Filed Oct. 23, 1969, Ser. No. 868,752
Claims priority, application Germany, Dec. 7, 1968, P 18 13 338.5
Int. Cl. A47h *1/04*
U.S. Cl. 16—96 6 Claims



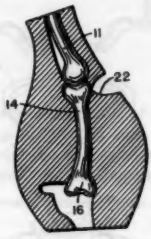
A curtain rod which is rigid in the vertical plane has supporting wings and guide means for curtain suspension members extending from both sides.

3,644,963

PROCEDURE FOR THE REMOVAL OF THE BONES FROM HAMS AND SIMILAR CUTS OF MEAT

Federico Terranova, 45 Parkview Drive N.E., Grand Rapids, Mich.

Filed July 24, 1969, Ser. No. 844,575
Int. Cl. A22c *17/04*
U.S. Cl. 17—46 3 Claims



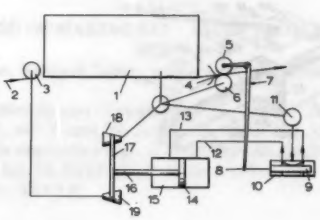
A ham or a structurally similar cut of meat is conditioned for a coaxial rotary meat-stripping operation by removal of the kneecap and pinbone. The pinbone is removed by a tool surrounding the pinbone, and moved axially to a sufficient depth to isolate it from the adjacent leg bone, and preferably to a sufficient degree to sever it from its connection thereto at the upper extremity of the pinbone. The kneecap is removed by a nipping operation from the side.

3,644,964

APPARATUS FOR CONTROLLING THE VARIATION OF SLIVER DELIVERED FROM A CARDING MACHINE

John Maximilian Jules Varga, Toronto, Ontario, Canada, assignor to Carding Specialists (Canada) Limited, Toronto, Canada

Filed Aug. 29, 1969, Ser. No. 854,170
Claims priority, application Great Britain, Sept. 3, 1968, 41,750/68
Int. Cl. D01h *5/38*
U.S. Cl. 19—240 10 Claims

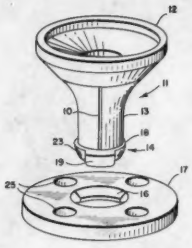


The invention comprises a method of and means for controlling the count of a sliver while being fed from a carding machine to ensure a substantially uniform sliver, the sectional size of the sliver being related to a valve setting and passed through sensing means so that any slight variation in the sliver size is sensed and magnified to operate the valve which operates a fluid motor which in turn operates variator control means capable of causing correction of the sliver size.

3,644,965
SNAP FASTENER

Edward Joel Kahn, Baltimore, Md., assignor to Togs, Inc., Baltimore, Md.

Continuation-in-part of application Ser. No. 819,144, Apr. 25, 1969, which is a continuation-in-part of application Ser. No. 781,296, Oct. 14, 1968, now abandoned. This application Oct. 2, 1969, Ser. No. 863,060
Int. Cl. A44b *1/32*
U.S. Cl. 24—90 R 5 Claims

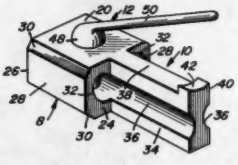


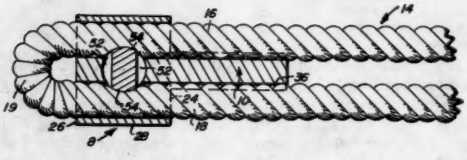
The invention disclosed is for a two-part snap-on fastening device which includes a button member having a stud projecting therefrom, and a foundation member securable to a garment. The projecting stud mates with the foundation member in a semipermanent fashion so that disengagement does not result during normal wearing conditions. In a preferred embodiment, the button portion is made of relatively hard material having a stud integral therewith, the free end of which is bulbous and adapted to be inserted into the somewhat resilient foundation member and form a semipermanent connection therewith.

3,644,966
LINE CLAMP

Edward Ted Higgins, Saginaw, Mich., assignor to Line and Rope Clamp, Inc., St. Charles, Mich.

Continuation-in-part of application Ser. No. 819,754, Apr. 28, 1969, now abandoned. This application Mar. 19, 1970, Ser. No. 21,064
Int. Cl. F16g *11/00*
U.S. Cl. 24—134 QA 10 Claims



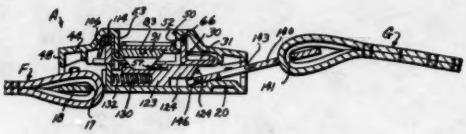


A line clamp for use when called upon to manually bend and form an adjustable nooselike eye at an end portion of a bendable boat tying line, a tent staking or stay rope, a tarpaulin holddown rope, clothesline or the like. It comprises a blocklike body provided with open-ended spaced parallel first and second holes for passage of first and second loop-forming portions of the associated line. A median portion of the body has a third hole providing a passage for a clamping pin for oriented space parallel portions of the line. This pin has readily accessible manually actuatable handling and latching means.

3,644,967
SAFETY BELT BUCKLE

Louis Romanzi, Jr., Brighton Township, Mich., and Robert C. Pfeiffer, Lexington, Ky., assignors to Irvin Industries Inc., Lexington, Ky.

Filed Dec. 4, 1968, Ser. No. 781,016
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 AK 14 Claims

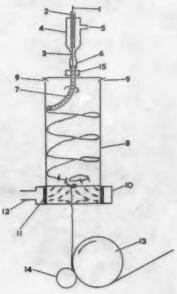


A pushbutton-type safety belt buckle having a movable latch member for releasable retention of a tongue connector plate in operable engagement with a catch dog member, and cam means for relative translatory linear movement of the latch member to enable release of the tongue connector plate from the catch dog member on movement of the pushbutton by depression thereof.

3,644,968
APPARATUS FOR RELAXING YARNS

David Robert Elliott, and John Michael Greenway, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 31, 1969, Ser. No. 889,518
Claims priority, application Great Britain, Dec. 31, 1968, 61,962/68
Int. Cl. D02g *1/00*
U.S. Cl. 28—1.2 8 Claims



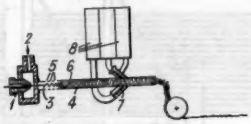
Apparatus for relaxing yarns comprising a fluid device for tensioning and forwarding the yarn to a hot relaxation zone wherein tension is caused to fall.

3,644,969

PROCESS FOR PRODUCING YARNS SHOWING NOVEL VARYING COLOR EFFECTS

Rene Guillermin, Bron, and Jean Joly, Brindas, both of France, assignors to Societa Rhodiaceta, Paris, France

Continuation-in-part of application Ser. No. 649,089, June 16, 1967. This application Nov. 25, 1969, Ser. No. 879,880
Claims priority, application France, June 28, 1966, 67290
Int. Cl. D02g *1/12*
U.S. Cl. 28—72.14 2 Claims



Yarns showing novel color effects varying along their length are made by feeding a thermoplastic yarn into a confined space, so forming a long stack of uniform cross section of folded yarn in the said space, by means of a jet of fluid at a temperature sufficient to set the resulting crimp in the yarn, and feeding a dye solution, preferably two or more dye solutions at different locations to the same cross section of the stack, under conditions such that the resulting intensity of color of the yarn due to each dye falls off across the stack from the point or points of application.

3,644,970

METHOD OF MANUFACTURING AN ANODE MEMBER FOR AN X-RAY TUBE

Yoshitaka Seki, and Kaname Tanabe, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Continuation-in-part of application Ser. No. 723,399, Apr. 23, 1968, now abandoned. This application July 7, 1970, Ser. No. 52,824
Claims priority, application Japan, Apr. 28, 1967, 42/27129
Int. Cl. H01j *9/16, 9/44*
U.S. Cl. 29—25.18 3 Claims

A method of manufacturing an anode member for an X-ray tube comprising the steps of preparing a cylindrical metal body with uniform thin thickness, inserting said metal body into a press mold in which at least one portion of its die hole is formed into a cylindrical shape and the other portion of said die hole assumes a polygonal cross section, inserting a cylindrical filler into the metal body, and applying pressure to the metal body through said filler to form part of the body into a polygonal shape in cross section.

3,644,971

METHOD FOR MANUFACTURING ROLLING BEARING COMPONENTS AND COMPONENT MANUFACTURED ACCORDING TO THE METHOD

Gunnar Bertil Axbard, Goteborg, Sweden, assignor to SKF Industrial Trading and Development Co. N.V.

Filed May 15, 1970, Ser. No. 37,689
Claims priority, application Sweden, May 16, 1969, 6935/69
Int. Cl. B21d *53/12*
U.S. Cl. 29—148.4 C 3 Claims

The method for manufacturing rolling bearing components such as cages and cage portions for deep groove ball bearings or angular contact ball bearings and loose guiding rings for spheric roller bearings by forming the material, which may be sheet metal or wire, to a spring formed unit, cutting a coil of

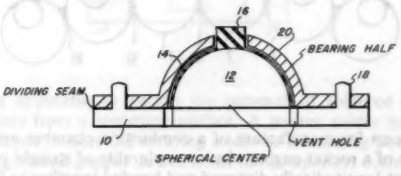
the unit, joining the overlapping ends of the coil by welding, whereupon the joint is pressed to such an extent that the thickness of the material is uniform all around the unit and thereupon giving the unit the final shape in a press.

3,644,972

METHOD FOR PRODUCING BEARING HEMISPHERICAL CAVITIES

John L. Evans, Oakland, and Anthony G. Rubino, Nutley, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 24, 1969, Ser. No. 836,025
Int. Cl. B21d *53/10;* B23p *11/00*
U.S. Cl. 29—149.5 2 Claims



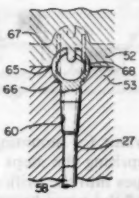
Method of manufacturing high-accuracy bearing for gas gyro using casting techniques. The bearing cavity is formed using a die or tool in the form of an accurately machined half sphere fastened to a flat baseplate. The baseplate is fitted with locating pins that locate the outer diameter of the housing half. The die used in said method is an aluminum alloy coated with a thin film of a silicone rubber coating.

3,644,973

METHOD OF MAKING BALL STUDS FROM METAL RODS

Michio Abe, Kasugai, Japan, assignor to Tokai Cold Forming Co. Ltd.

Continuation-in-part of application Ser. No. 715,207, Mar. 22, 1968, now Patent No. 3,553,826, dated Jan. 12, 1971. This application Apr. 7, 1970, Ser. No. 26,202
Int. Cl. B21d *53/10;* B23p *11/00, 17/00*
U.S. Cl. 29—149.5 B 4 Claims



A method of making a ball stud from a metal rod, comprising the steps of cutting from the metal rod, a blank having

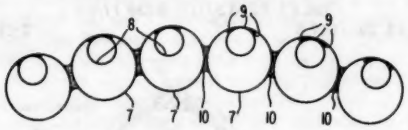
generally the same volume and outer diameter as that of a finished ball stud, forwardly extruding one end of the blank positioned within a die cavity to form a taper, stem and shank portions, forming a preliminary cylindrical shape with a shallow cavity on the other end of the blank, the diameter of said preliminary cylindrical portion being smaller than the outer diameter of a finished spherical head, backwardly extruding the other end to form a preliminary cylindrical shape having a wall of generally the same thickness as that of a finished spherical head portion, and upsetting the preliminary cylindrical shape to form a spherical hollow head portion in the die cavity, whereby the upsetting operation is achieved with an application of a mixture of oil and air to pressurize the inner space of the spherical hollow head portion.

3,644,974

PROCESS FOR MANUFACTURING COMBUSTION CHAMBER AND/OR NOZZLE OF A ROCKET

Michael Simon, Hamburg-Othmarschen, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft

Filed Mar. 17, 1969, Ser. No. 807,703
Claims priority, application Austria, Mar. 15, 1968, A 2619/68
Int. Cl. B21d *53/00*
U.S. Cl. 29—157 **3 Claims**



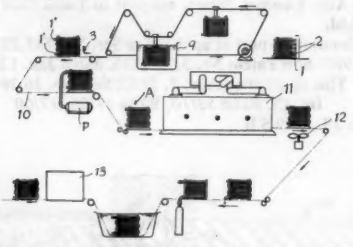
Process for manufacture of a combustion chamber and/or nozzle of a rocket engine wherein a plurality of straight pipes are first longitudinally disposed and bonded together to form a cylindrical chamber and then the chamber is shaped to form a nozzle configuration, the pipes possibly additionally including cooling pipes and inserts disposed therein.

3,644,975

METHOD OF MANUFACTURING A HEAT EXCHANGER

Keiichi Kimura, 2-304, Osakabe, Yao, Japan

Continuation-in-part of application Ser. No. 649,325, June 27, 1967, now abandoned. This application Dec. 24, 1969, Ser. No. 887,826
Int. Cl. B21d *53/02*
U.S. Cl. 29—157.3 V **9 Claims**



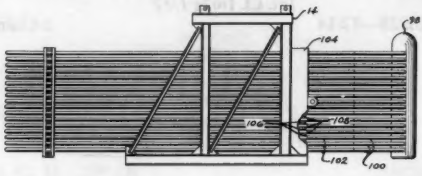
Method and apparatus for mounting fins unto pipes for a heat exchanger comprising the steps of placing a predetermined number of pipes into the orifices of one or more fins, the outer diameter of the pipes being less than the orifices, sealing liquid in said pipes, and heating said liquid to a superheated vapor to expand said pipes so as to expand the outer diameter of the pipes to tightly fit within the orifices.

3,644,976

METHOD FOR CONSTRUCTING SUPERHEATER AND/OR REHEATER MODULES

James C. Roberts, Jr., Avon, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 21, 1970, Ser. No. 30,370
Int. Cl. B21d *53/02;* **B23p** *15/26*
U.S. Cl. 29—157.4 **5 Claims**



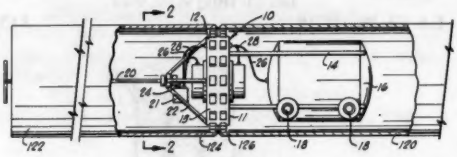
A method for shop assembly of superheater and/or reheater modules wherein a segment of a superheater or reheater header, as it is formed in the shop, is accurately positioned in a vertical orientation with respect to a fixed reference base. A lifting and shipping frame is particularly positioned on the reference base with respect to the header segment. Individual tube panels are placed in the frame and joined to the header until a complete module is built up. The module may then be conveniently shipped in its frame to the erection site where it may be positioned and joined to similar modules to form the unitary superheater or reheater structure.

3,644,977

APPARATUS FOR ALIGNING THE ENDS OF ADJOINING LENGTHS OF PIPE

L. Travis Valentine, 1303 Davon Ln., Houston, Tex.

Filed Dec. 3, 1969, Ser. No. 881,839
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P **6 Claims**



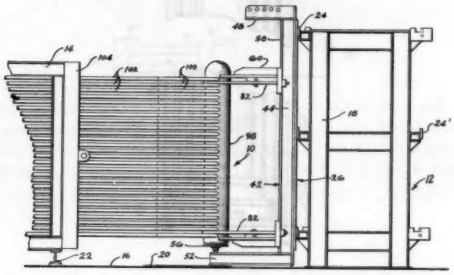
The present disclosure relates to apparatus for aligning the ends of adjoining lengths of pipe so that they may be conveniently welded together, such as in the construction of pipelines and the like. A cylindrical housing having a pair of drive wheels rotatably journaled therein is movably supported inside the pipe lengths to be welded together. A plurality of elongated shaft members are pivotally attached to each of the drive wheels in spaced relation around the peripheries thereof, said shaft members each having one end extending outwardly from the sides of the housing and being slidably secured therein so that rotation of the drive wheels causes the shaft members to be moved inwardly or outwardly with respect to the housing. Means are attached to the housing for selectively rotating the drive wheels, and a shoe for contacting the inside surfaces of the pipe without causing damage thereto is attached to each of the shaft members. The apparatus of the present disclosure is positioned with the shoes inside adjoining ends of the lengths of pipe and the drive wheels are rotated so that the shoes are extended outwardly against the inside surfaces thereof, thereby securing the ends of the lengths of pipe in an aligned position.

3,644,978

ASSEMBLY FIXTURE FOR CONSTRUCTING SUPERHEATER AND/OR REHEATER MODULES

Robert P. Sullivan, Chattanooga, and John N. McClain, Signal Mountain, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 28, 1970, Ser. No. 32,573
Int. Cl. B23p *15/26*
U.S. Cl. 29—202 R 9 Claims



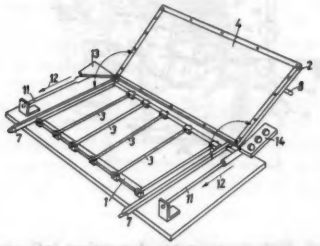
A fixture for shop assembly of superheater and/or reheater modules including a structural frame having accurately machined surfaces to enable exact positioning of a segment of a superheater or reheater header in a particular orientation with respect to a lifting and shipping frame mounted on a fixed reference base. The module may then be completed by placing individual superheater or reheater tube panels in the frame and joining them to the header.

3,644,979

DEVICE FOR FITTING CONDUCTOR PLATES

Ernst Bura, Bickenbach, Germany, assignor to Fernseh GmbH, Am Alten Bahnhof, Germany

Filed Mar. 27, 1970, Ser. No. 23,325
Claims priority, application Germany, Apr. 3, 1969, G 69 13 559
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B 5 Claims



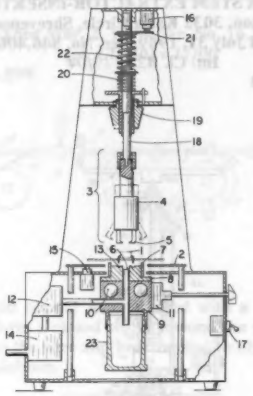
A device for fitting electrical components upon conductor plates comprising a frame for accommodating the plates and a cover capable of being closed upon the frame, the inner side of the cover being provided with a layer of foam material which with a membrane also on the cover forms an adjustable air cushion which can be varied by pumping air into it to accommodate electrical components of varying height.

3,644,980

COMPONENT REMOVAL DEVICE

Charles A. Class, Jr., Oreland; Robert M. Van Zyl, Lafayette Hill, and Donald C. Sedberry, Oreland, all of Pa., assignors to Pace, Inc., Silver Spring, Md.

Filed June 25, 1969, Ser. No. 836,391
Int. Cl. H01r *3/00*
U.S. Cl. 29—203 B 3 Claims



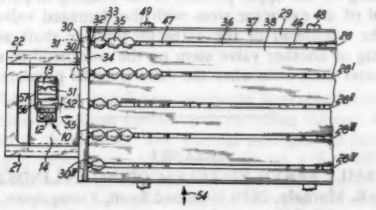
An apparatus to permit the removal of soldered components from a mounting surface. A molten solder bath is employed to heat the securing solder to its melting point. A spring loaded gripper device holds the component during the heating operation. When the securing solder becomes liquid the component is lifted from the mounting surface by the gripper device. During this removal process a vacuum is applied to the mounting area to remove the liquid solder from the mounting holes and the surrounding surface.

3,644,981

DEVICE FOR FACILITATING PULLUP OR SLIDERS ON SLIDE FASTENER CHAINS

Pertti O. Gustavsson, Bogesundsgatan 6, Boras, Sweden

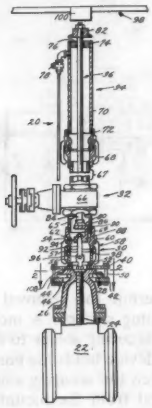
Filed Mar. 18, 1970, Ser. No. 20,556
Claims priority, application Germany, Mar. 19, 1969, P 19 13 873.9
Int. Cl. B23p *19/04*
U.S. Cl. 29—207.5 SL 11 Claims



Device for facilitating pullup of sliders on slide fastener chains, in which storage means containing rows of sliders, which may differ in color or style from each other, are movable in a direction transverse to the rows to align a selected

row of sliders with gripping means which are movable from a rest position distant from the storage means to an advanced position for gripping in the advanced position a slider at the end of the selected row and for withdrawing the gripped slider from the storage means during return of said gripping means to the rest position while holding in said rest position the slider in a position facilitating pull up of the latter with a slide fastener chain.

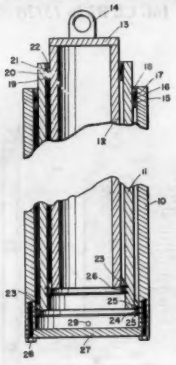
3,644,982
VALVE STEM EXTRACTOR-INSERTER
Jimmy J. Anderson, 3032 Karla Circle, Shreveport, La.
Filed July 31, 1969, Ser. No. 846,406
Int. Cl. B23p *19/04*
U.S. Cl. 29—213 **5 Claims**



A tool for removing stems from and inserting stems into nonrising stem, valve assemblies while the valve assembly is under fluid pressure is provided which comprises an adjustable attachment assembly for clamping the tool to a valve bonnet, a hollow cylindrical tool housing made up of readily separable sections and an extractor-inserter shaft equipped with a stem carrying workhead. The extractor-inserter shaft is carried within the tool housing and is both axially slidable relative to the housing and rotatably mounted within the housing, about its longitudinal axis, to effect the insertion or removal of a valve, stem from a valve assembly. A lower section of the cylindrical tool housing is provided with a valve for sealing off the upper portion of the housing to permit the removal of an extractor stem with the damaged valve stem from the workhead of the extractor-inserter shaft and the mounting of another valve stem on the workhead of extractor-inserter shaft even when the valve is under pressure.

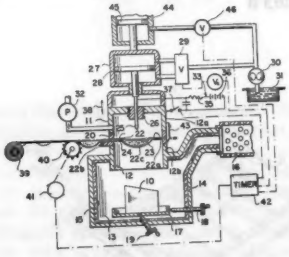
3,644,983
EASILY SERVICED TELESCOPING CYLINDER
Charles E. Margala, 2610 Hubbard Road, Youngstown, Ohio
Filed Nov. 6, 1969, Ser. No. 874,438
Int. Cl. B22d *19/10;* **B23p** *7/00*
U.S. Cl. 29—401 **4 Claims**

A telescoping cylinder in which the annular stops which, in cooperation with the collars on the lower ends of the inner sleeves, limit the upward travel of the inner sleeves are permanently welded to the inner walls of the sleeves. The bottom wall of the cylinder assembly is removable to permit rapid assembly and disassembly of the cylinder, even after



the cylinder has been subjected to prolonged and/or extremely heavy service.

3,644,984
KINETIC DEPOSITION OF PARTICULATE MATERIALS
Kiyoshi Inoue, No. 182, 3-Chome, Tamagawayoga-machi, Setagaya-ku, Tokyo, Japan
Continuation-in-part of application Ser. No. 574,056, Aug. 22, 1966, now Patent No. 3,416,617, and a continuation-in-part of 629,633, Apr. 10, 1967, now Patent No. 3,461,268, and a continuation-in-part of 696,757, Jan. 10, 1968, now Patent No. 3,552,653. This application Mar. 4, 1969, Ser. No. 805,117
Int. Cl. B21d *26/12*
U.S. Cl. 29—421 **6 Claims**

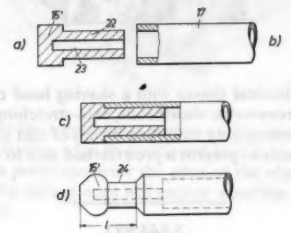


Method of high-energy-rate deposition of particulate materials upon a receiving surface whereby the particles are propelled against the receiving surface with sufficiently high kinetic energy to effect bonding between the particles and the surface. The high-kinetic-energy propulsion of the particles is effected by impulsive spark discharge. Apparatus for the repeated propulsion of unit masses of such particles whereby a belt having a series of encapsulated particle masses is passed intermittently between the discharge source and surface, the belt forming one of the discharge electrodes.

3,644,985
PROCESS FOR PRODUCING PROBE HEADS, AND PROBE HEAD FOR INTERNAL COMPARISON MEASUREMENTS

Hermann Koltgen, Martin-Buber-Strasse 50, Darmstadt, Germany

Filed Aug. 21, 1969, Ser. No. 851,863
Claims priority, application Switzerland, Aug. 24, 1968, 12852/68
Int. Cl. B23k *31/02*
U.S. Cl. 29—481 8 Claims

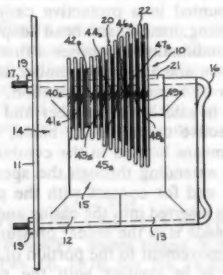


Process for producing probe heads for accurate instruments intended to be used for internal measurements and for gauging bores or other passages or cavities. The process comprises applying a closure member to the end of a tube, securing them together, forming a central longitudinal slit extending axially inwardly from the outer extremity of the closure member into the end of the tube adjacent the closure member, and forming the opposite end of the tube for attachment to a holder.

3,644,986
METHOD OF TUNING HIGH-VOLTAGE TRANSFORMER FOR TELEVISION RECEIVER

Jugal K. Verma, Portsmouth, Va., assignor to General Electric Company

Filed Nov. 26, 1969, Ser. No. 880,221
Int. Cl. G01r ; G05f
U.S. Cl. 29—593 6 Claims

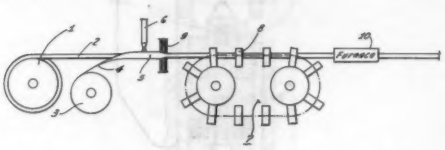


A method of tuning a high-voltage transformer for television receivers and the like wherein the primary and high-voltage windings are wound around and axially spaced from one another in a plurality of axially spaced circumferential slots provided on the exterior of hollow, electrically insulative coil form means, the interior of which surrounds a portion of the transformer core means. The axial spacing of the primary and high-voltage windings that is provided by the unique construction of the novel slotted coil form means permits the coefficient of coupling between the primary and high-voltage windings novel to be made both ideal and constant. This, in turn, allows tuning of the transformer in accordance with the novel method of the present invention which represents considerable simplification over the complex method previously required to tune the prior art, layer-wound transformers.

3,644,987
METHOD FOR MANUFACTURING SUPERCONDUCTORS

Ernst Scheffler, Langenhagen, and Gerhard Ziemek, Hannover, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Mar. 2, 1970, Ser. No. 16,335
Int. Cl. H01v *11/00*
U.S. Cl. 29—599 8 Claims

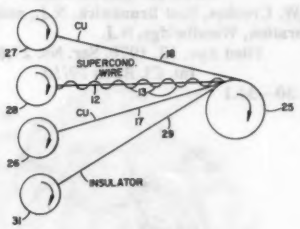


A tin-plated copper wire is lined with a tape containing niobium to form a closed sleeve around the wire. The sleeve is drawn onto the wire and heat-treated to obtain diffusion of tin into the niobium.

3,644,988
METHOD OF FABRICATING COMPOSITE SUPERCONDUCTIVE CONDUCTOR

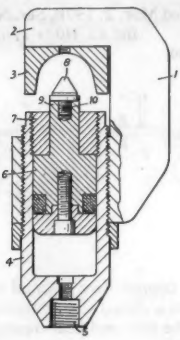
Glenn A. Anderson, Nashua, N.H., assignor to Avco Corporation, Cincinnati, Ohio

Original application Feb. 20, 1968, Ser. No. 706,840, now Patent No. 3,504,314. Divided and this application Nov. 12, 1969, Ser. No. 871,278
Int. Cl. H01c *11/00*
U.S. Cl. 29—599 2 Claims



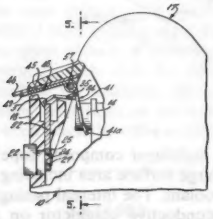
A ribbon-type multilayer composite superconductive conductor having a large surface area including internal surfaces exposed to the coolant. The internal passages are formed by winding a superconductive conductor on a first ribbon of conductive material disposed between and separating two outer ribbons of conductive material whereby in combination with said ribbons the space between adjacent turns of the superconductive conductor defines passages on both sides of said inner ribbon, the passages on one side preferably being disposed at an angle to the passages on the other side of the inner ribbon and the normal material intermediate the turns of the superconductive conductor providing a low-resistance shunt path in the event one or more turns are driven into the normal state.

3,644,989
METHOD OF JOINTING ELECTRICAL CABLES AND TOOL THEREFOR
John Edward Morby, Banbury, England, assignor to Alcan Research and Development Limited, Quebec, Canada
Filed Jan. 6, 1970, Ser. No. 947
Claims priority, application Great Britain, Jan. 8, 1969, 1,255/69
Int. Cl. H01r 43/00; H05k
U.S. Cl. 29—628 6 Claims



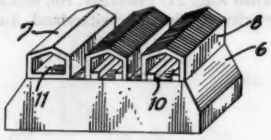
For forming an electrical connection between a cable, which may be coated with a nondraining insulating material, and a ductile metal ferrule into which the cable is inserted a special compression tool is employed. The compression tool consists of a support and a punch, which tapers stepwise and is also tapered between adjacent steps so that the punch may progressively pull more metal into the depression formed by the punch and yet may be withdrawn easily from the depression.

3,644,990
CLUTCH MECHANISM
Le Roy W. Crookes, East Brunswick, N.J., assignor to Ronson Corporation, Woodbridge, N.J.
Filed Apr. 13, 1970, Ser. No. 27,665
Int. Cl. B26b 19/10
U.S. Cl. 30—34.1 8 Claims



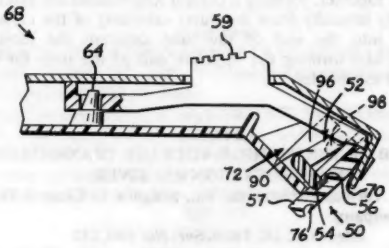
A mechanism is provided for selectively engaging and disengaging the auxiliary long hair trimmer of an electric dry shaver to the shaver drive means. The long hair trimmer, which is driven by the same source as is the main shaving head of the shaver, may be engaged or disengaged at any time whether or not the shaver is energized.

3,644,991
SHEARED ASSEMBLY FOR MECHANICAL SHAVER
Paul Kobler, 81 Fenimore St., Lynbrook, N.Y.
Filed Feb. 3, 1969, Ser. No. 795,889
Int. Cl. B26b 19/42
U.S. Cl. 30—34.2 7 Claims



On a mechanical shaver with a shaving head comprising a plurality of removable shearheads, skin-stretching means and selective interengaging mounting means of said shaving head, said shearheads to present a prestretched skin to an adjoining shearhead.

3,644,992
RAZOR ASSEMBLY
John E. Bennett, Jamestown, N.Y., and Richard Craig Briggs, Warren, Pa., assignors to Sylvania Electric Products Inc.
Filed Apr. 7, 1970, Ser. No. 26,327
Int. Cl. B26b 21/16, 21/54
U.S. Cl. 30—64 7 Claims

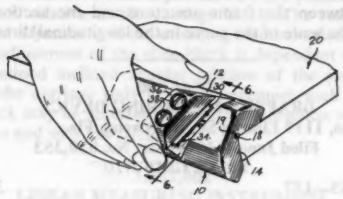


A razor blade holder for a razor blade having at least one cutting edge mounted in a protective casing comprising a combination housing, handle, and head adapted for receiving the blade, the combination comprises a first member having an aperture therein and a second member adapted to join to the first member to form the combination, a blade latching means mounted in said lower member and adapted for engaging the protective casing of the blade, and a one-piece blade releasing means housed in the combination and comprising a button extending through the aperture in the first member and an end for contact with the protective casing when the blade is inserted into the casing and on the opposite end. When the blade is in the holder pressure exerted on the button provides movement to the portion of the blade releasing means that is in contact with the protective casing thereby ejecting the blade from the holder.

3,644,993
EDGE-TRIMMING DEVICE
Leland Chupp, 210 South 23rd St., Goshen, Ind.
Filed Feb. 9, 1970, Ser. No. 9,551
Int. Cl. B26b 29/00
U.S. Cl. 30—280 6 Claims

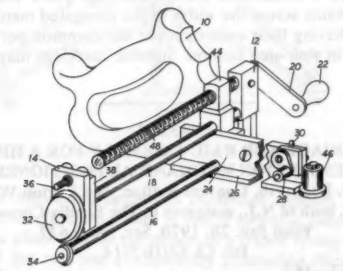
A device for trimming the edge of an object, such as an article of manufacture, including a hand-held guide member having an object-engaging part and a grip part. The object-engaging part of the guide member has a longitudinal groove formed therein which conforms in cross section generally to

the shape of the object at the edge thereof. The grip part has a transverse groove formed therein which intersects the longitudinal groove in the object-engaging part. A cutting blade is disposed within the transverse groove of the grip part and is anchored to the guide member. The cutting blade



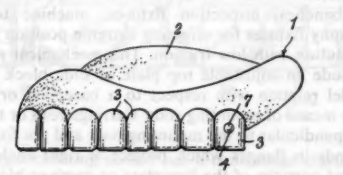
protrudes into the longitudinal groove of the object-engaging part with its cutting edge so positioned that as the object-engaging part is positioned over the edge of the object and slid therealong, the cutting edge will engage a portion of the edge and remove it.

3,644,994
WALLBOARD-CUTTING APPARATUS
Runar Lind, 199 New Jersey Ave., Bergenfield, N.J.
Filed Dec. 15, 1969, Ser. No. 885,052
Int. Cl. B26b *3/08*
U.S. Cl. 30—292 **5 Claims**



A cutter for wallboard employing two parallel rods with rotary cutters on one set of aligned ends. Means are provided for varying the separation between cutters without varying the spacing between the rods. A support for a wallboard edge can be moved back and forth in the axial direction along the rods to vary the separation between cutters and support as desired.

3,644,995
DENTURE OR A DENTAL PLATE
Bruno Olsson, 85 Oxford Pl., Staten Island, N.Y.
Filed Feb. 16, 1970, Ser. No. 11,535
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **1 Claim**

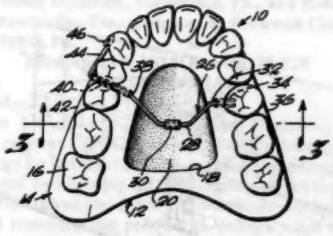


A denture or dental plate comprising a gum portion in which a plurality of teeth are mounted, with one or more of the teeth being provided with a laterally extending projection, such as the rounded head of a pin, to enable said head to be finger-engaged to facilitate the dislodgement and removal of the denture from within the mouth.

3,644,996
PREFABRICATED DENTURE CONSTRUCTION AND METHOD
Milton L. Weinkle, 420 Lincoln Road, Miami, Fla.
Filed Sept. 29, 1969, Ser. No. 861,617
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **1 Claim**

Denture bases in a plurality of standard sizes are mass produced and stocked by dentists in order to fit and tailor a set of artificial dentures to an individual patient during a single visit. The standard denture bases are made by use of reusable mold assemblies which include cavity-forming bodies made of an elastically deformable material.

3,644,997
DENTURE DEVICE WITH A SUCTION DIAPHRAGM
Jose de Jesus Fernandez, 430 N.E. 29th, Miami, Fla.
Filed Mar. 29, 1971, Ser. No. 129,029
Int. Cl. A61c *13/24*
U.S. Cl. 32—3 **7 Claims**



This invention pertains to a dental plate providing an enlarged aperture through the molded structural material thereof and a flexible diaphragm, molded into said material, in enclosing relation to the hole. Lever means are provided which is operable, after the dental plate is properly seated in the mouth to, first, expel the air between the dental plate structure and the gingival tissues of the mouth and, second, to selectively create a comfortable degree of partial vacuum between the dental plate and the gingival tissues to hold the dental plate firmly in place. Detent means are provided to lock the lever means in any of a plurality of positions.

3,644,998

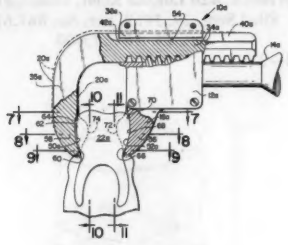
DENTAL INSTRUMENT

Victor H. Rubino, 1088 N. Main St., West Hartford, Conn.

Continuation-in-part of application Ser. No. 829,187, June 2, 1969, now abandoned. This application Nov. 16, 1970, Ser. No. 89,835

Int. Cl. A61c *3/10*

U.S. Cl. 32—61 **14 Claims**



A tooth-extracting instrument having a housing and including a pair of jaws having opposing beaks defining a plurality of spaced-apart tooth-engaging surfaces for complementary clamping engagement with opposite faces of a tooth to be extracted. One of the jaws is fixedly mounted on the housing. The other of the jaws is supported in generally parallel relation to the fixed jaw by the housing for movement generally toward and away from the fixed jaw in response to rotation of an axially elongated handle journaled by the housing. The movable jaw is further arranged for slight angular movement relative to the fixed jaw to permit the various tooth-engaging surfaces to be brought into positive clamping engagement with a tooth to be extracted in response to axial rotation of the handle.

3,644,999

APPARATUS FOR MARKING ONE OR MORE LINES ON A FRAME SECTION OR THE LIKE

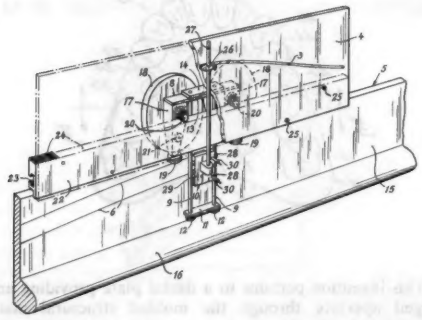
Borre Bengt Ulrichsen, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway

Filed June 9, 1969, Ser. No. 831,366

Claims priority, application Norway, June 10, 1968, 2258

Int. Cl. B43l *13/10*

U.S. Cl. 33—23 C **11 Claims**



The invention comprises a simple and reliable mechanical marking device for marking on a frame section for the shipbuilding industry a line that becomes straight when the section is bent to the desired curvature of the frame. The device operates with a physical curve representing the inverted form of the desired curvature and having a reduced scale in the longitudinal direction. The device comprises a frame structure carrying a marking means and a curve follower means that are rigidly interconnected. The frame structure is movable along the frame section in engagement with a longitudinal edge thereof, and the curve is mounted on the frame structure for movement therewith in the transverse direction and for movement relatively thereto in the longitudinal direction of the section with a speed, the ratio of which to the relative speed between the frame structure and the section is the same as the scale of the curve in the longitudinal direction.

3,645,000

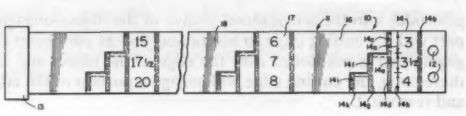
DRAPERY-MEASURING DEVICE

Sadie Gass, 1119 Lincoln St., Hollywood, Fla.

Filed June 4, 1969, Ser. No. 830,353

Int. Cl. G01b *3/10*

U.S. Cl. 33—137 **3 Claims**



A drapery-measuring device comprising an elongated member having alternate elastic and inelastic sections, each of which is respectively equal in length to the other similar sections in the device: in the preferred form, each inelastic section begins at a line extending transversely of the elongated member where one end of an inelastic section is stitched to a continuous elastic web, the piece comprising three portions across the width of the elongated member, the portions having their ends opposite the common portion terminating in stair-step fashion. Suitable markings may be provided.

3,645,001

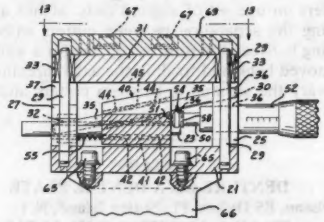
CARRIAGE AND RAIL ASSEMBLY FOR A HIGH-RESOLUTION MECHANICAL POSITIONER

Robert H. Bosworth, Convent Station, and Burton W. Roney, Wayne, both of N.J., assignors to The Bendix Corporation

Filed Jan. 28, 1970, Ser. No. 6,627

Int. Cl. G01b *5/14*

U.S. Cl. 33—162 **6 Claims**



A carriage and rail assembly for a high-resolution mechanical positioner suitable for application to apparatus such as optical benches, inspection fixtures, machine tools and photography fixtures for effecting extreme position accuracy and resolution with low friction. The mechanical positioner may include an adjustable top plate or slide block mounted in parallel relation with respect to a baseplate or carriage block by means of mounting rods. Carriage rods or tracks extend perpendicular to the mounting rods and are fixed at opposite ends in flanges which project at right angles to opposite end portions of the baseplate or carriage block, while additional positioning rods or tracks are fixed at opposite ends in flanges which project at right angles to opposite end portions of the adjustable slide block. An actuating member

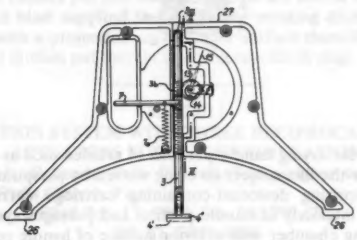
by means of bushings or antifriction bearings is slidably mounted on the respective carriage and positioning rods in an arrangement in which the actuating member is mechanically coupled to the slide block through the positioning rods which are inclined in a predetermined angular relation to the carriage rods so that a horizontal positioning of the actuating member effects a vertical adjustment of the position of the slide block relative to the carriage block. The ratio of the horizontal adjustment of the actuating member relative to the vertical adjustment of the slide block is dependent upon the predetermined inclined angular relation of the positioning rods to the carriage rods in an arrangement such that the slide block may be adjusted with extreme position accuracy, resolution and with low friction.

3,645,002

LINEAR MEASURING INSTRUMENT

Willy Hefti, Lausanne, Switzerland, assignor to Hebor S. A., Lausanne, Switzerland

Filed Oct. 27, 1969, Ser. No. 869,626
Int. Cl. G01b *3/22, 5/00, 5/18*
U.S. Cl. 33—172 R **6 Claims**



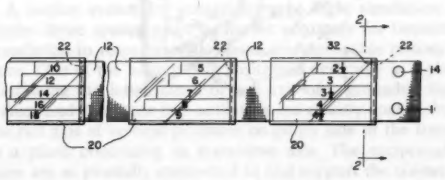
A linear measuring apparatus comprises support feet for placing on a reference plane. A rod is movable perpendicularly to the plane against the action of a return spring. An extremity of the rod has a sidewardly protruding flange with vertical play equal to its own thickness. The rod has a rack driving a pinion with a pointer which directly indicates a measurement with reference to the plane, taken from either the upper or lower surface of the flange.

3,645,003

DRAPERY-MEASURING DEVICE

Sadie Gass, 1119 Lincoln St., Hollywood, Fla.

Filed Dec. 15, 1969, Ser. No. 884,815
Int. Cl. B43l *9/08*
U.S. Cl. 33—192 **5 Claims**



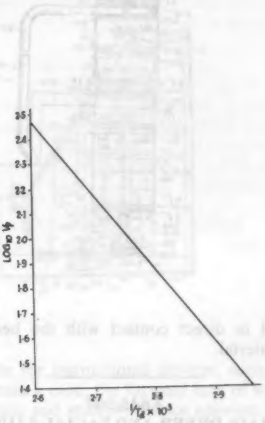
A drapery-measuring device has a continuous elastic strip on which is a series of uniformly spaced indicia bearing plastic sleeve elements each connected to the elastic strip only at a single transverse line, as by a single row of stitching or grommets.

3,645,004

DRYING OF EFFLORESCENT MATERIAL

Christopher John Ogle, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England

Filed Aug. 25, 1969, Ser. No. 852,670
Claims priority, application Great Britain, Aug. 27, 1968, 40,972/68
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **7 Claims**



A process for drying an efflorescent material which is in the form of a paste or slurry. The process comprises pressure filtering the paste or slurry to express water and to form a filter cake the solids content of which is at least 50 percent by weight. The filter cake is thereafter divided into small discrete particles which are contacted with air having a temperature, being less than 100° C., and a relative humidity, being less than 90 percent RH, which will not cause loss of water of crystallization from the efflorescent material.

3,645,005

CALCIUM HYPOCHLORITE MANUFACTURE

George Roman Dychdala, Norristown, Pa., and Robert James Cox, Brownsville, Tex., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 14, 1970, Ser. No. 28,529
Int. Cl. F26b *3/00*
U.S. Cl. 34—22 **4 Claims**

Calcium hypochlorite compositions, containing at least about 65 percent $Ca(OCl)_2$ on a dry weight basis and which are resistant to exothermic, self-propagating decomposition, are prepared by charging the wet crystals of neutral calcium hypochlorite dihydrate from the synthesis operation to a dryer and removing the product therefrom when the water content is within the range of 6 percent to 15 percent by weight.

3,645,006

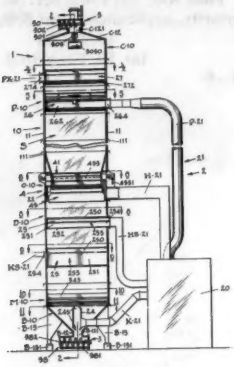
PARTICULATE MATERIAL-DRYING APPARATUS AND METHOD

Robert J. ..nderson, Toledo, Ohio, assignor to The Andersons, Maumee, Ohio

Filed Sept. 8, 1969, Ser. No. 856,009
Int. Cl. F26b *3/00*
U.S. Cl. 34—22 **7 Claims**

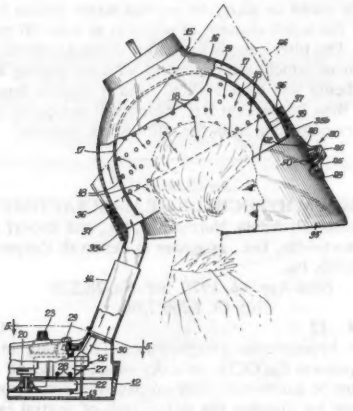
A method of drying particulate material, particularly that which, like grain, has a critical degree of heat tolerance,

while the material forms and moves through a bed of material, utilizing a heated dry gaseous medium and passing the



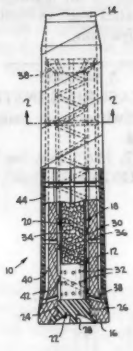
same to and in direct contact with the bed-forming and traversing material.

3,645,007
HAIR DRYER AND FACIAL SAUNA
William H. Scott, Lombard, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 14, 1970, Ser. No. 2,736
Int. Cl. A45d *20/24*
U.S. Cl. 34—60 **11 Claims**



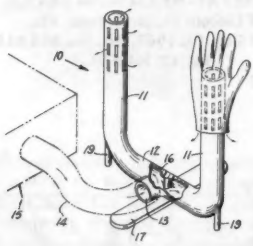
A hair dryer of the type having a rigid hood within which a person's head is positioned in order to dry the hair by means of heated air discharged through perforations on the inner wall of the hood toward the hair to be dried. Means are provided to circulate steam into the helmet and out through the perforations whereby the steam fills the volume under the hood. A detachable extension is provided on the hood to extend the lower edge of the hood downwardly to horizontal plane thereby providing an enclosure within which the entire head may be received for the purpose of treating the hair and face with steam. Control means on the enclosure permit adjustment of the level of steam enclosed within the hood and the extension.

3,645,008
ARTICLE HAVING HANDLE PORTION WITH INTERNAL DESICCANT-CONTAINING CARTRIDGE
Kurt Delsack, 8409 Westmont Terrace, Bethesda, Md.
Filed Oct. 16, 1970, Ser. No. 81,416
Int. Cl. F26b *21/06*
U.S. Cl. 34—81 **9 Claims**



Means for drying handle portions of articles such as tennis rackets or the like subject to being wetted by perspiration in use, comprising desiccant-containing cartridge carried in chamber interiorly of handle portion and passageways communicating chamber with exterior surface of handle portion. A moistureproof container is shown for storing and/or drying the cartridges, the container preferably including a desiccant material having greater adsorptivity than the desiccant material of the cartridges.

3,645,009
GLOVE- AND BOOT-DRYING DEVICE
Calvin Eugene Ketchum, 1855 Labona Drive, Eugene, Oreg.
Filed Apr. 13, 1970, Ser. No. 27,826
Int. Cl. F26b *25/00*
U.S. Cl. 34—104 **1 Claim**



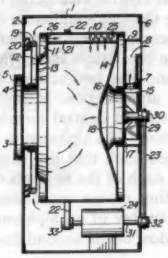
A device for attachment to hair dryers and the like which will serve to dry wet articles, such as boots and gloves. This device includes a swivel-type base upon which is supported a tubular element having a multiple number of openings for the passage of heat from the dryer in order to dry the articles, particularly from the inside.

3,645,010

CLOTHES DRIER

Takashi Korekawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 3, 1970, Ser. No. 60,508
Claims priority, application Japan, Aug. 11, 1969, 44/64941; 44/64943; 44/64944; 44/64945; 44/64946; 44/64947; 44/64948
Int. Cl. F26b *11/02*
U.S. Cl. 34—133 2 Claims



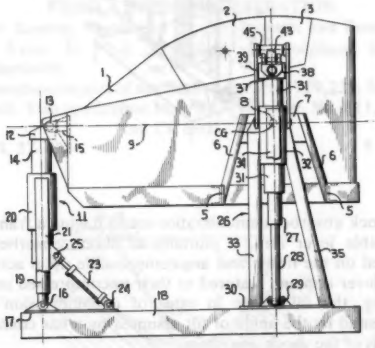
This invention relates to a drum-type clothes drier in which the wet clothes put into a rotating drum are stirred and dried in a hot blast supplied thereinto. The rotating drum is provided with a projection on the inner surface thereof for stirring the clothes put therein to accelerate the drying.

3,645,011

MOTION SYSTEM WITH THREE RECIPROCATING ACTUATORS FOR FLIGHT SIMULATION

Oliver E. Callanen, Falls Church, Va., assignor to Melpar Inc., Falls Church, Va.

Filed Feb. 17, 1969, Ser. No. 799,687
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 P 31 Claims



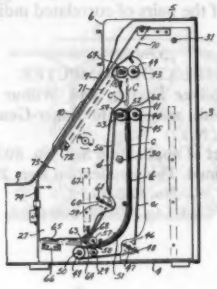
A motion system for general purpose flight simulation includes three spaced-apart hydraulic actuators for imparting translation to respectively associated reciprocable pistons or rams. One of the actuators is positioned vertically in a plane containing the longitudinal or roll axis of a grounded flight trainer and the other two actuators are equally spaced from the roll axis at vertical positions on either side of the trainer in a plane containing its transverse axis. The reciprocable rams are so pivotally connected to and support the trainer at the forward end and respective sides so to enable the trainer to undergo independent rotation about its pitch and roll axis, such that vertical translation of the forward ram produces rotation of the trainer about its pitch axis, and that unequal vertical translations of both of the other rams produces rotation of the trainer about its roll axis.

3,645,012

CARD FEEDER FOR INSTRUCTIONAL DEVICES

Raymond H. Fiehler, Kirkwood; John J. Dickman, Lemay, and Max Diamant, University City, all of Mo., assignors to Missouri Research Laboratories, Inc., St. Louis, Mo.

Continuation-in-part of application Ser. No. 699,485, Jan. 22, 1968, now abandoned. This application Mar. 23, 1970, Ser. No. 21,804
Int. Cl. G09b *3/00*; B65h *3/04*
U.S. Cl. 35—9 R 1 Claim



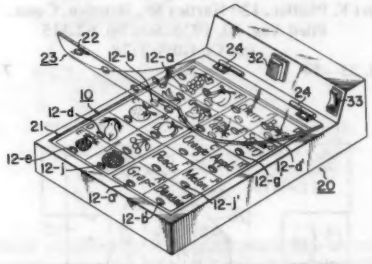
A card feeder for instructional devices, such as teaching machines, wherein a card, the forward face of which, having inscribed question and multiple choice answers, is presented to the viewer and with the rearward face being suitably adapted for cooperating with a photoemissive source to effect requisite energization of indicators for signaling the correctness or incorrectness of the answer chosen; said feeder incorporating mutually contacting drive and driven belts for effecting separation of inadvertently mutually adhering cards moving therebetween for feeding of a single card into viewing position to assure accuracy in energizing the appropriate indicators; said drive belt having spaced-apart transversely extending ribs for defining recesses compatible with the size of the cards being accommodated.

3,645,013

TEACHING MACHINE USING ELECTRICALLY CONDUCTIVE TRAINING CARDS

Kouji Takeuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Gakushu Kenkyusha, Tokyo, Japan

Filed Dec. 12, 1969, Ser. No. 884,472
Claims priority, application Japan, Dec. 28, 1968, 43/114457
Int. Cl. G09b *7/00*
U.S. Cl. 35—9 C 7 Claims



A teaching machine is provided with a plurality of normally open electric current paths each connected to an indicator. The current paths are arranged in accordance with a predetermined program and are individually closed to actuate the indicator by means of an electrically conductive train-

ing card which is positionable on the teaching machine. Each training card has various pairs of correlated indicia on one side and electrically conductive paths on the other side, the conductive paths being arranged to overlie and make electrical contact with respective ones of the current paths of the teaching machine when the training card is positioned thereon. Each training card is also provided with an aperture adjacent each indicia and a pair of plugs are provided which are insertable through individual apertures and function to close one of the current paths and thereby actuate the indicator when the user inserts the plugs through the apertures corresponding to one of the pairs of correlated indicia.

3,645,014

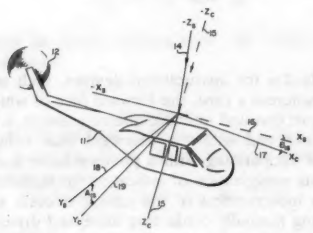
SIMULATOR COMPUTER

Arnold Bramson, Silver Spring, and Wilbur H. Day, Annapolis, both of Md., assignors to Singer-General Precision, Inc., Binghamton, N.Y.

Continuation-in-part of application Ser. No. 803,703, Mar. 3, 1969, now abandoned. This application Dec. 29, 1969, Ser. No. 888,423

Int. Cl. B64g *7/00*; G09b *9/08*

U.S. Cl. 35—12 F **7 Claims**



This system provides means for computing the forces and moments on and developed by the rotary wing of rotary-wing aircraft for realtime simulation purposes. The system includes a plurality of control signal generators for generating information relating to various components of rotary-wing aircraft and means to compute from these resultant signals quantities representative of the final resultant forces on the aircraft, its rotary wing, and other components. In particular, this specification describes equipment for computing the forces and moments developed by and on the rotary wing by utilizing aircraft design data and data produced in actual flight tests.

3,645,015

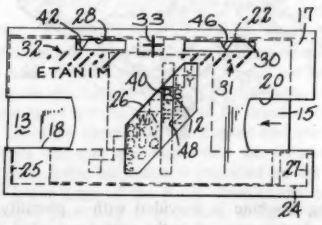
MORSE CODE TEACHING DEVICE

Dagobert F. Pfeiffer, 120 Hartley St., Hamden, Conn.

Filed Aug. 10, 1970, Ser. No. 62,315

Int. Cl. G09b *1/28*

U.S. Cl. 35—14 **7 Claims**



A device for teaching Morse code comprising four flat members in superposition. These four members comprise a base member imprinted with alphamerics except ETANIM, a first central member slidably mounted on the base member having a series of windows for viewing a selected group of alphamerics from among those imprinted on the base member, a second central member slidably mounted on the first central member having a window positioned at right angles to the series of windows on the first central member, and a top member mounted on the second central member and affixed to the base member. The window of the second central member permits viewing a single indicium from among the selected group of alphamerics viewed through the series of windows in the first central member. The top member has a window for viewing the single indicium observable through the window in the second central member. The top member has imprinted thereon the letters ETANIM, and the positive integers if desired, and has two sets of Morse indicia corresponding to these alphamerics. Means are provided for sliding the first and second central members relative to the top and bottom members. The alphameric indicia on the base member are positioned such that the sum of any Morse indicium selected from each of the two sets of Morse indicia by movement of indicating means associated with the central members will cause display of an alphameric corresponding to the sum in the window of the second central member.

3,645,016

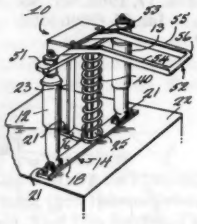
SHOCK ABSORBER DEMONSTRATION STAND

John A. Wiegand, Northbrook, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Aug. 11, 1970, Ser. No. 62,798

Int. Cl. G09b *25/00*

U.S. Cl. 35—50 **9 Claims**



A shock absorber demonstration stand having a frame and a movable lever arm, a plurality of shock absorbers are mounted on the frame and are compressible upon actuation of the lever arm and restored to their uncompressed state by a spring, the difference in rates of decompression being represented by the angle of tilt assumed by a bar connecting the ends of the shock absorbers.

3,645,017

SKI BOOT CONSTRUCTION

Horst R. Hickmann, Cincinnati, Ohio, assignor to AMF Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 815,289, Apr. 11, 1969, now abandoned. This application Mar. 18, 1970, Ser. No. 20,694

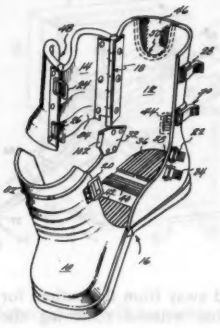
Claims priority, application Canada, Dec. 8, 1969, 69,252

Int. Cl. A43b *00/00*

U.S. Cl. 36—2.5 AL **53 Claims**

A ski boot construction including a flexible inner boot portion separable from an outer boot portion. The outer boot comprises substantially rigid toe and heel shells hinged together and a closure member hinged to the heel shell. Buckles and clasps are provided so that the shells and the

closure may be fastened in a unitary structure about the inner boot. Cooperating means are provided in the interior of



the outer boot and the exterior of the inner boot to fix the inner boot with respect to the outer boot.

ERRATUM

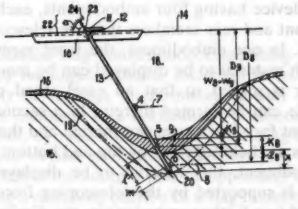
For Class 36—58.5 see:
Patent No. 3,646,497

3,645,018

METHOD AND APPARATUS FOR EXCLUDING SILT FROM A DREDGING OPERATION

Jan De Koning, Soetendaal 20, Amsterdam, and Romke van der Veen, 21 Prof. Dr. Hesselaan, Jutphaas, both of Netherlands

Continuation-in-part of application Ser. No. 729,229, May 15, 1968. This application Mar. 28, 1969, Ser. No. 811,396
Int. Cl. E02f *3/88*
U.S. Cl. 37—58 7 Claims



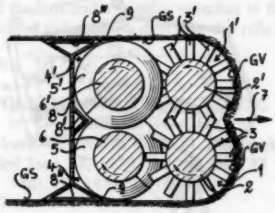
By measuring pressures in the particulate solid material surrounding a suction pipe at known points spaced along the pipe, sand of one known specific gravity which is covered by a layer of silt of another specific gravity may be dredged to the exclusion of the silt. Due to the difference in specific gravities, the approximate location of the interface between the sand and silt may be monitored and the lower end of the pipe moved so as to maintain it below such interface at all times during the dredging operation.

3,645,019

APPARATUS EQUIPPED WITH WORM MEANS FOR DIGGING A DITCH OR THE LIKE

Raphael Mengis, Muhlehofstrasse 14, 6030 Ebikon, and Hans Mengis, Kirtenhofstrasse 38, 6000 Luzern, both of Switzerland

Filed Feb. 2, 1970, Ser. No. 7,689
Claims priority, application Switzerland, Feb. 27, 1969, 2924/69
Int. Cl. E02f *5/04*
U.S. Cl. 37—82 6 Claims



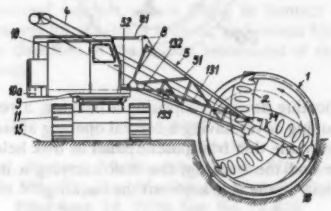
An apparatus for digging a ditch by means of worms and capable of being secured to a vehicle, which apparatus comprises a group of at least four closely situated cooperating worms each disposed in an essentially upright position. Each of these worms has worm threading, with two respective ones of said worms cooperating with one another to define a front pair of worms and the remaining two worms cooperating with one another to define a rear pair of worms. Each worm of the front pair is in tandem with respect to a given worm of the rear pair. There is also provided means for imparting rotational movement to the worms of both pairs from the inside towards the outside when viewed from the front of the apparatus with each of the respective two worms which are arranged in tandem having the same direction of rotation and with their threading engaging with one another.

3,645,020

BOOM-MOUNTED ROTARY-WHEEL TRENCH EXCAVATOR

Dragoljub Beslin; Benko Beherano, both of Zemun, and Radivoj Mirkovic, Belgrade, all of Yugoslavia, assignors to Strojna Tovarna Trbovlje, Trovlje, Yugoslavia

Filed Sept. 2, 1969, Ser. No. 854,657
Int. Cl. E02f *5/08*
U.S. Cl. 37—91 11 Claims



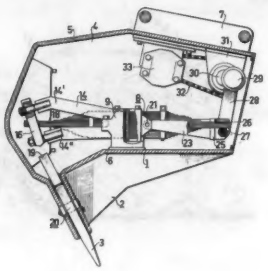
A vehicle supported by caterpillar tracks has an outrigger arm carrying a rotatable drum with its axis slightly inclined to the direction of travel so that a front face of the drum, equipped with an array of cutting blades, bites into the soil to dig a trench as the vehicle moves forward. A conveyor belt extends at an acute angle into the open rear face of the drum to carry off detached clods while a retractable stop projects inwardly from the drum periphery to entrain larger fragments toward a scraper disposed above the belt within the drum.

3,645,021

ARRANGEMENT IN LOADER BUCKETS AND THE LIKE PROVIDED WITH DIGGING BLADES

John Teodor Sonerud, Hudiksvall, Sweden, assignor to Svenska Hymas Aktiebolag, Hudiksvall, Sweden

Filed Sept. 30, 1968, Ser. No. 763,850
Claims priority, application Sweden, Sept. 28, 1967, 13364/67; May 17, 1968, 6748/68
Int. Cl. E02f 9/28
U.S. Cl. 37—141 **10 Claims**



An arrangement for a loader bucket provided with digging teeth which are reciprocably displaceable in their longitudinal direction to create a picking action of the teeth against the surface to be broken and penetrated. The apparatus includes a leaf-spring arrangement which is in engagement with and actuated by a drive mechanism so as to create an oscillating movement of the teeth in the direction of swing. One end of the spring is connected to hammer means adapted to actuate, by means of impact, one or more digging teeth in a direction of movement away from the loader bucket.

3,645,022

INDICATING MEANS FOR GOLF CLUB COVER AND THE LIKE

Robert F. Anderson, 3613 13th St., Menominee, Mich.

Filed Nov. 3, 1969, Ser. No. 873,206
Int. Cl. G09f 3/18
U.S. Cl. 40—10 **5 Claims**

An indicating device comprising a backing, a resilient annular retaining cover having a central opening affixed thereto and a removable thin transparent panel or disk held between the cover and the backing, the disk carrying a numeral or other indicia on the side adjacent the backing.

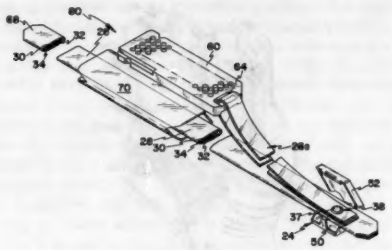
3,645,023

PROVIDING IDENTIFICATION

Roger V. Larson, Murray, Utah, assignor to Bio-Logics, Inc., Salt Lake City, Utah

Filed Sept. 15, 1969, Ser. No. 858,039
Int. Cl. G09f 3/14
U.S. Cl. 40—21 C **1 Claim**

An identification combination comprising a band adapted to be fitted about the wrist, leg, neck or the like of a patient or about an object and further including a tether strap attached to or adapted to be attached to an encodable identification device and to the band so that the identification



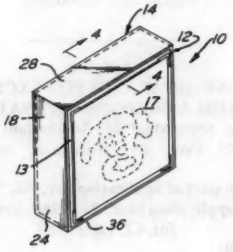
device can be held away from the patient for transfer of information therefrom without removing the identification device from the patient.

3,645,024

DISPLAY DEVICES

Melvin B. Herrin, and Lenard H. Herrin, both of 15th & Huntingdon Sts., Philadelphia, Pa.

Continuation of application Ser. No. 710,184, Mar. 4, 1968, now abandoned. This application May 28, 1970, Ser. No. 41,537
Int. Cl. G09f 1/00
U.S. Cl. 40—124.1 **7 Claims**



A display device having four embodiments, each of which comprises front and rear members that are telescopically interconnected. In one embodiment, the front member has a face on which material to be displayed can be mounted. The rear member is scored so that an easel stand or a hook receiving hole can be formed therein. In a second embodiment, the front face has a coin slot therein and the front and rear members are held together by top and bottom covers. In a third embodiment, the material to be displayed is on a fabric which is supported by the telescoping front and rear members, and in a further embodiment, the display device is incorporated in a dispenser housing.

3,645,025

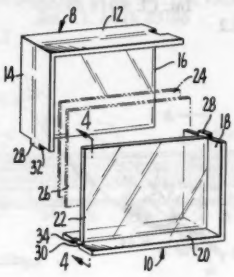
PICTURE FRAME

Albert S. Giesecke, 400 Montgomery St., San Francisco, Calif.

Filed Oct. 28, 1970, Ser. No. 84,637
Int. Cl. G09f 1/12
U.S. Cl. 40—152 **3 Claims**

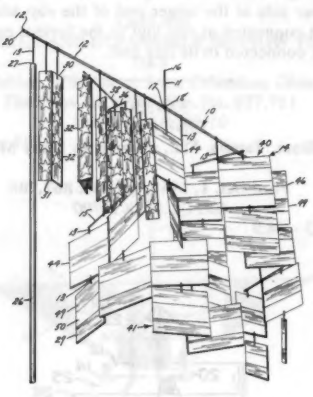
A picture frame or the like is provided having two complementary sections which fit together. Each section includes two side members and a transparent face member with the face members slightly offset from each other. When two

complementary sections are placed together, a small space is left between the face members so that pictures or the like



can be inserted therein and will be visible from both sides of the frame.

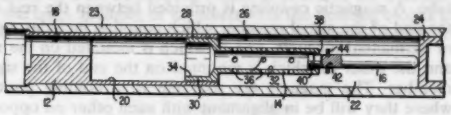
3,645,026
ARTICULATED FLAG CONSTRUCTION
Leonard G. Lorch, 115 Lafayette Pl., Woodmere, N.Y.
Filed July 20, 1970, Ser. No. 56,448
Int. Cl. G09f *17/00*
U.S. Cl. 40—218 **2 Claims**



An articulated flag construction comprising a mobilelike assembly of rectangular planar members interconnected independently or through interconnection with other similar rectangular members to a horizontally positioned main support member, by means of linkages permitting relative rotational and/or orbital movement therebetween, each of said planar members including a pair of oppositely disposed surfaces having a matching portion of a flag thereon, said planar members, when in coplanar relation forming a substantially continuous display area.

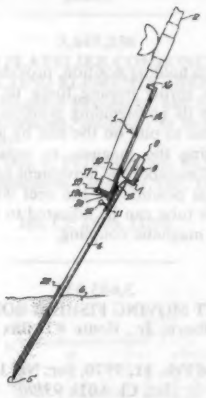
3,645,027
BLANK CARTRIDGE AMMUNITION ADAPTER FOR FIREARMS
Harold C. Palmer, Palmer Village, Box 867, Douglasville, Ga.
Filed June 10, 1970, Ser. No. 44,975
Int. Cl. F41c *21/10*
U.S. Cl. 42—77 **6 Claims**

An adapter for converting a single-shot rifle to use for firing a dart-type projectile. A 0.50-caliber or any other rifle or shotgun bore is modified to receive a 0.22 or any size caliber blank cartridge which is less than that of the rifle bore by a cylindrical member having an offset, reduced-diameter bore



at the base end thereof and a wiggler member at the nose end thereof for assisting in loading a dart into the rifle bore.

3,645,028
FISHING POLE HOLDER AND SIGNALING MEANS THEREFOR
Donald G. Rayburn, 427 North Reese Pl., Burbank, Calif.
Filed June 22, 1970, Ser. No. 48,133
Int. Cl. A01k *97/10, 97/12*
U.S. Cl. 43—17 **8 Claims**

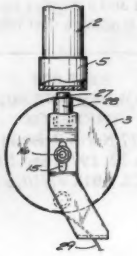


An adjustable fishing pole holder having means for signaling a strike. The holder includes an elongated support element for insertion into the ground, a signaling means mounted at the top end of the support element, a carriage slidably mounted on the support element, a first support means carried by the carriage for supporting the lower end of a fishing pole, a second support means pivotally mounted on the holder for supporting the fishing pole above its lower end, the second support means being in contact with the signaling means for actuation thereof, and means for tension-biasing the direction of the pivotal movement of the second support means.

3,645,029
ICE FISHING TIP-UP
Benjamin C. Roemer, Manitowish Waters, Wis., assignor to Trueflight Mfg. Co., Inc., Manitowish Waters, Wis.
Filed Sept. 14, 1970, Ser. No. 71,820
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 **5 Claims**

An ice fishing tip-up including a tube having a sealed end and an open end and a stand for the tube to position it with the sealed end below the surface of the ice and with the open end projecting above the surface of the ice. A visual signal member is mounted inside the tube for movement between a nonsignaling position within the tube and a signaling position outside the tube. The sealed end of the tube is sealed by means of a cap member fitted over the end of the tube. A

spring is connected to the signal member to bias it for movement from the nonsignaling to the signaling position. A reel with a fishing line is mounted adjacent the sealed end of the tube. A magnetic coupling is provided between the reel and the end of the signal member which coupling includes a pair of permanent magnets, one of which is mounted on the reel and the other of which is mounted on the end of the signal member. The magnets are movable to a holding position where they will be in alignment with each other on opposite sides of the cap member on the end of the tube. The mag-



nets, when in such holding position, provide a magnetic force greater than the spring biasing force to thereby hold the signal member in its nonsignaling position. When the reel is moved in response to pull on the line by a fish, the reel will be rotated causing the magnets to separate and thereby release the signal member for movement to its signaling position. The vertical position of the reel with respect to the sealed end of the tube can be adjusted to thereby adjust the sensitivity of the magnetic coupling.

3,645,030
BAIT MOVING FISHING BOBBER

Raymond E. Milburn, Jr., Route #1, Box 128, Round Lake, Ill.

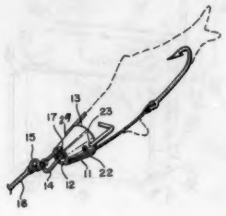
Filed Feb. 11, 1970, Ser. No. 10,571
Int. Cl. A01k *93/00*
U.S. Cl. 43—26.1 6 Claims

A bobber having a hollow spherical float with a spring motor mounted therein driving an actuator rod in a plurality of short, with periodic comparatively long, generally vertical reciprocal movements to impart a lifelike action to a fishing bait or lure connected to the actuator rod.

3,645,031
TROLLING RIG

Richard A. Egles, 310 East 37th St., Hialeah, Fla.

Filed Mar. 24, 1970, Ser. No. 22,244
Int. Cl. A01k *83/06*
U.S. Cl. 43—44.2 2 Claims

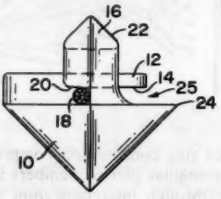


A trolling rig for bait fishing having a substantially frustoconical-shaped cap with an oval cross section adapted to receive the head of the bait fish. The smaller end portion of the cap has an opening at its upper side, and a safety-pin snap is connected to the opening. An opening is provided on each side of the cap at the larger end portion and a fish locking pin extends through the openings and the head of the fish, securing the fish to the cap. A further opening is formed in the lower side at the larger end of the cap and a flexible member is connected at one end to the further opening with a fishhook connected to its free end.

3,645,032
LINE CLAMP

Joe L. Gilliam, Tampa, Fla., assignor to Mary Melvin, Tampa, Fla.

Filed Oct. 1, 1969, Ser. No. 862,706
Int. Cl. A01k *95/00*
U.S. Cl. 43—44.9 4 Claims



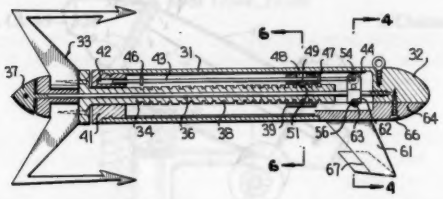
A line clamp for rapid and easy attachment to the central portion of a fishing line comprising a sinker body formed by an upper segment cantilevered to a lower segment defining a slot therebetween and a bridge integral with the lower segment and overlying the upper segment to provide an opening for passage of the line therethrough. Notches are provided in the bridge at its points of attachment to the lower segment which are aligned with the closed end of the slot. A bight of the line is passed through the opening, engaged in the closed end of the slot, and then straightened to place the line in the bridge notches. The open end of the slot is disposed inside a plane defined by the top of the bridge and a side edge of the lower segment to prevent closure of the slot when the sinker is dropped.

3,645,033

FISHING LURE HAVING A FISHHOOK IMPELLER

James H. Kress, 580 Harwood Ave., Satellite Beach, Fla.

Filed Sept. 18, 1970, Ser. No. 73,327
Int. Cl. A01k *85/06*
U.S. Cl. 43—26.2 8 Claims



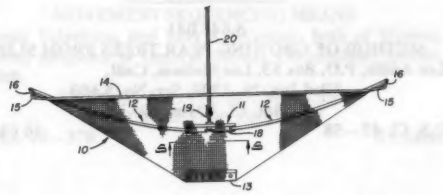
A fishing lure employs an array of fishhook members as an impeller to cause a part of the lure to rotate as it is moved through the water. In one arrangement, the lure is provided with diving planes having their angle of attack altered periodically by a mechanism driven from the rotating impeller. The angle of attack of the diving planes may, in different embodiments, be maintained alternately in one or the other positions set by the drive mechanism or maintained normally in a neutral position with brief periodic intervals of alternately positive and negative angles of attack.

3,645,034

COLLAPSIBLE AND EXPANSIBLE MINNOW TRAPPING NET

Lloyd L. Pfahler, 1784 Glenn Ave., Columbus, Ohio

Filed Nov. 18, 1969, Ser. No. 877,711
Int. Cl. A01k *69/10*
U.S. Cl. 43—105 4 Claims



A plurality of resilient ribs are each connected at one end to each corner of a net and the other end is pivotally connected to a central supporting plate. The plate is provided with downwardly opening channels receiving a portion of the ribs when the plate is in an overcenter position for holding the net in expanded set condition and the ribs under tension. A cable is connected to the plate for forcing the same through dead center to release the tension in the ribs and to collapse the net.

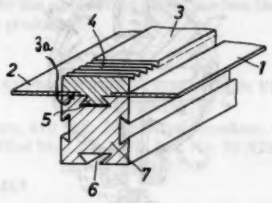
3,645,035

TOY BUILDING KIT

Artur Fischer, Altheimer Strasse 219, 7241 Tumlingen, Germany

Filed Nov. 28, 1969, Ser. No. 880,549
Claims priority, application Germany, Nov. 30, 1968, P 18 11 940.9
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 11 Claims

A toy building kit includes one or more strip-shaped track members each having an upper and a lower side. A plurality of building blocks are provided some of which have male coupling means and others of which have mating female coupling means. Connecting means is provided for connecting the track member or members with the building blocks in such a manner that some of the building blocks are located at



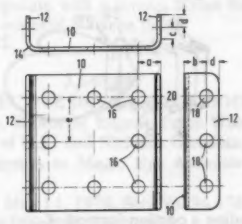
the upper side and others of the building blocks are located at the lower side of the track member with the male and female coupling means of the blocks located at the upper and lower sides being in coupling engagement. The track member then extends laterally of the thus connected building blocks.

3,645,036

U-SHAPED PLATELIKE COMPONENTS AND CONNECTING ELEMENTS THEREFOR

Horst Biesterfeld; Manfred Brennecke, and Sampo Widmann, all of Munich, Germany, assignors to Bertram Deininger, Munich, Germany

Filed Oct. 9, 1970, Ser. No. 79,571
Claims priority, application Germany, Oct. 10, 1969, P 19 51 313.4
Int. Cl. A63h *33/06*
U.S. Cl. 46—23 11 Claims



A set of toy components made of platelike material and of U-shaped form. Screws and internally screw-threaded sleeves or other fasteners are provided for connecting the elements together. The elements are provided with hole arrangements so as to allow the limbs of a U-shaped part to be connected with the web portion of another element. The fasteners may have sockets for fastening axles and wheels thereto.

3,645,037

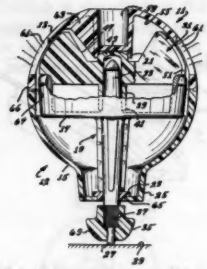
NOISE-MAKING TOY TOP

Albert R. Baginski, Torrance; John T. Benson, Los Angeles; Jacob DeGelder, Torrance, and Gabriel Marason, Jr., Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 2, 1970, Ser. No. 86,016
Int. Cl. A63h *1/28*
U.S. Cl. 46—66 9 Claims

A toy top having a housing with a gyroscopic-type rotor mounted on a freely rotatable shaft that extends below the housing and terminates at a spinning tip which supports the top in spinning engagement with a playing surface, the top in-

cluding impeller structure rotating with the rotor within the housing, and the latter including intake and exhaust apertures for allowing the impeller to draw air into the housing and expel the air in a flow interrupted at an audible frequency.



3,645,038

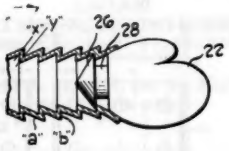
FIGURE TOYS

Howard J. Morrison, Highland Park, and Marvin I. Glass, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 29, 1970, Ser. No. 6,795

Int. Cl. A63h *3/00*

U.S. Cl. 46—151 **5 Claims**



A toy including a portion formed of corrugated plastic tubing which is capable of being contracted and expanded in length and of being curved in an arc, and which will retain any length and/or curvature given to the tubing. The tubing is formed by providing a series of hinge sections along its length forming a continuous series of grooves having sides of unequal length, and by heat treating the plastic to provide a setting of the plastic at the hinges to eliminate elasticity between the hinge connected sections.

3,645,039

MOVING TOY

Helmut Bross, Biberttalstrasse 24, Altenberg, near Nuremberg, Germany

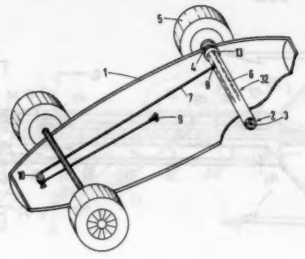
Filed Nov. 21, 1968, Ser. No. 777,805

Claims priority, application Germany, Nov. 22, 1967, P 16 03 225.0

Int. Cl. A63h *17/00*

U.S. Cl. 46—206 **20 Claims**

A toy car in which the drive is produced by an axially extendable rubber cord. This cord may be wound around a rotary member which is connected, in one direction of rotation, by means of a one-way clutch, to a drive shaft for the wheels of the car. When the rubber cord is unwound completely from the rotary member, the one-way clutch slips to permit the drive shaft to continue to rotate. A reverse gearing is provided whereby the rotary member may be turned to wind on the rubber cord by pressing downwardly on the car and pushing it forwards.



3,645,040

UNBALANCED CULTURE METHOD OF ALGAE PRODUCTION

Jay E. Ort, Lubbock, Tex., assignor to ERA Incorporated, Clovis, N. Mex.

Continuation-in-part of application Ser. No. 676,195, Oct. 18, 1967, now Patent No. 3,521,400. This application July 16, 1970, Ser. No. 55,570

Int. Cl. C02c *1/00*

U.S. Cl. 47—1.4 **5 Claims**

Interruption of algal-bacterial symbiosis by high-intensity light permits increased algae production.

3,645,041

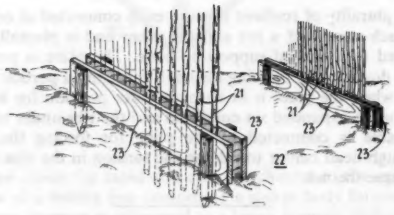
METHOD OF GROWING PEAR TREES FROM SLIPS

Leo Addin, P.O. Box 53, Los Molinos, Calif.

Filed Jan. 26, 1970, Ser. No. 5,603

Int. Cl. A01m *5/00*

U.S. Cl. 47—58 **10 Claims**



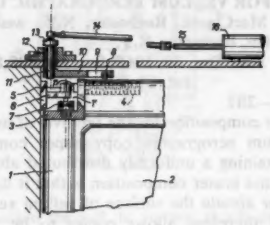
Healthy, vigorous pear trees are produced from pear tree slips by treating the bottom section of the slips with an aqueous slurry of proteins and trace quantities of amino acids and then planting the slips directly into a plant growth medium. The resulting trees are usually resistant to pear tree diseases, sustain growth rates which compare favorably with grafted trees, and have significantly lower mortality rates in advanced stages of growth.

3,645,042

APPARATUS FOR OPENING A SWING DOOR

Hans Peter Bolli, Schaffhausen, Switzerland, assignor to Carl Sigerist & Cie, Schaffhausen, Switzerland

Filed May 7, 1970, Ser. No. 35,457
Claims priority, application Switzerland, May 8, 1969, 7095/69
Int. Cl. E05f *15/04, 17/00*
U.S. Cl. 49—326 3 Claims



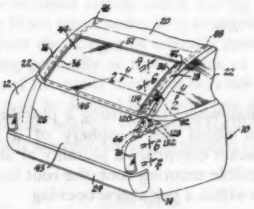
Apparatus for opening swing doors comprises a power operated driving unit for opening the wings of the door. A vertical shaft is situated above the outside upper corner of a wing and in the plane of the closed door wings. The shaft axis is displaced outwardly with respect to the pivoting axis of the wings. One end of the shaft has fixed thereto a movement transmission arm engaging the top of the wing and the other end of the shaft carrys a transmission arm which is connected by linkage means to said power operated driving unit. Owing to displacement of said vertical shaft axis outside of the pivoting axis of the door wing, an angular movement of 90° of the door wings requires an angular movement of less than 90° of said power unit operated transmission arm on the vertical shaft.

3,645,043

MOVEMENT SEQUENCING MEANS

Alfonsas Velavicius, and Bert R. Wanlass, both of Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1970, Ser. No. 72,587
Int. Cl. E06b *3/44*; E05f *11/54*
U.S. Cl. 49—370 5 Claims



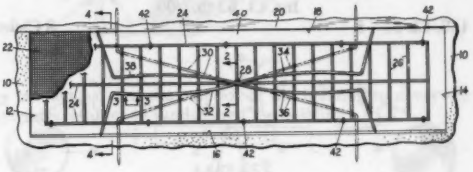
A predetermined operational sequence for a pair of closures supported on a vehicle body for independent movement relative to an opening in the vehicle body is maintained by movement sequencing means including a latchbolt engageable on a striker supported on a first of the two closures and operable in a latching position to maintain the first closure in the closed position, a detent lever movable between detenting and releasing positions and operable in the detenting position to maintain the latchbolt in the latching position, a bellcrank with stop means thereon which bellcrank is supported on the vehicle body for movement between an unblocking position and a blocking position in the path of motion of the second of the two closures to prevent movement of the second closure to the closed position, and a substantially inextensible connecting member connecting the detent lever to the bellcrank so that the bellcrank prevents movement of the detent lever from the detenting to the releasing, position when the second closure is in the closed position and the detent lever prevents movement of the bellcrank from the blocking to the unblocking position when the first closure is in the open position.

3,645,044

CLOSURE SUPPORT FOR FOUNDATION VENTS AND LIKE OPENINGS

Marvin L. Akre, 410 N.E. 20th Drive, Gresham, Oreg.

Filed May 22, 1970, Ser. No. 39,929
Int. Cl. E05c *21/02*
U.S. Cl. 49—465 3 Claims



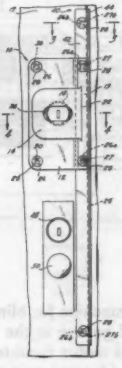
A base grill member smaller in dimensions than an opening to be closed mounts a plurality of gripping members at least one of which normally extends resiliently outward of the grill member for retractable engagement with the peripheral wall of the opening. Each resilient gripping member is retractable inwardly from said extended position to permit installation of the grill member in the opening, whereupon each resilient gripping member is allowed to extend outward into gripping engagement with the peripheral wall of the opening. The grill member may mount a closure member for closing the opening or it may cooperate with a screen across the opening to confine a closure material between them.

3,645,045

PROTECTIVE DEVICE FOR A DOOR

Melvyn A. Gervis, Haworth; Eugene Taras Wozny, Harrington Park, both of N.J., and Nicholas Giardina, Mount Vernon, N.Y., assignors to Magic Eye Associates, Inc., New York, N.Y.

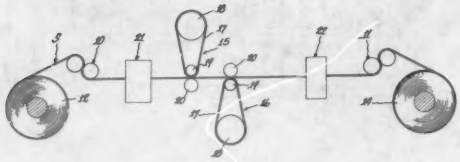
Filed May 11, 1970, Ser. No. 36,176
Int. Cl. E06b *1/04*
U.S. Cl. 49—504 3 Claims



A protective device for a door to prevent removal of the door lock, and to prevent access to the door and doorframe

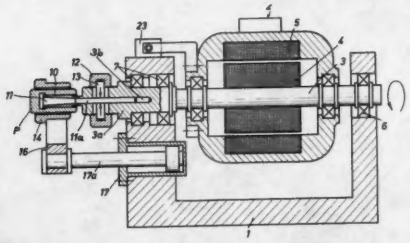
interface. A plate having first and second raised parts is secured to the door adjacent the door lock. The first raised part covers the lock. An opening in this raised part allows a key to pass therethrough but does not permit removal of the lock therethrough. The opening is elongated, whereby door locks variously spaced on the door may be protected by the plate. The second raised part partially covers a member which prevents access to the interface, which member can be moved along the interface to a preferred position prior to being secured to the plate and the door.

3,645,046
POLISHING OF STRIP METAL
Kenneth L. Bandy, Youngstown, Ohio, assignor to Wean Industries, Inc., Youngstown, Ohio
Filed Dec. 29, 1969, Ser. No. 888,274
Int. Cl. B24b *7/00*
U.S. Cl. 51—5 **8 Claims**



The metal strip to be polished is run through spaced drag and pull bridles to establish a tension on the strip portion therebetween. An abrasive device contacts a surface of the tensioned strip portion to polish such surface. The strip is run through the rolls of a leveler to continuously work the strip as it passes from the drag bridle to the abrasive device and thus relieve the strip of stresses and make more effective the tension on the strip so as to present a flat surface to said abrasive device. In so passing through the leveler, the strip is also elongated as in the usual tension leveling operation.

3,645,047
MACHINE FOR HONING BLIND-END BORES
Georges Garnier, Blois, France, assignor to Roto-Diesel, Paris, France
Filed Feb. 3, 1970, Ser. No. 8,169
Int. Cl. B24b *3/00, 5/00*
U.S. Cl. 51—92 R **6 Claims**

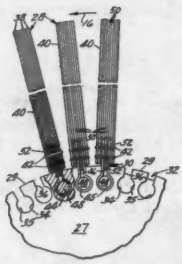


Automatic honing machine for blind-end bores having only a small annular relief groove at the bottom of the bore and comprising a frame, a motor mounted on said frame, an extensible hone actuated by said motor, an axially displaceable conical tie rod disposed along the axis of the hone and coupled to said hone so as to produce the extension thereof, wherein the motor is an electric motor having a stator pivotally mounted on the drive shaft which is supported by a stationary frame and maintained elastically in a position of equilibrium, and means for driving the conical tie rod in axial translation motion which are operated under the control of said pivotal stator in order to produce action on the extension of said hone and in order to control said extension in dependence on the resisting torque produced by the operation of said hone.

3,645,048
ERASER FOR VELLUM XEROGRAPHIC COPY PAPER
Robert H. MacClaren, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Dec. 29, 1969, Ser. No. 888,840
Int. Cl. B24b *1/00*
U.S. Cl. 51—281 **5 Claims**

An eraser composition for the removal of toner from translucent vellum xerographic copy paper comprising a wax binder containing a uniformly distributed abrasive. The advantage of the eraser composition is that it does not smudge the toner or abrade the surface of vellum xerographic copy paper, and therefore allows copies to be reproduced by diazo-type processes with no indications of erasures in the final copies.

3,645,049
WIDE FLAP WHEEL
Conrad T. Freerks; James C. Huppert, and Ralph E. James, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 21, 1968, Ser. No. 769,041
Int. Cl. B24b *9/02*
U.S. Cl. 51—334 **9 Claims**

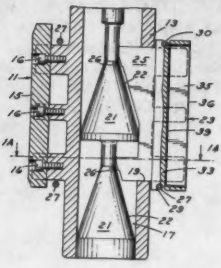


An abrasive flap-wheel comprising a plurality of abrasive packets secured about the periphery of a rotating hub wherein each packet comprises a plurality of abrasive sheets attached to a flexible securing root, the root being affixed to the rotating hub within a peripheral opening.

3,645,050
CUSHION MEANS BETWEEN ABRASIVE AND EXPANDERS
Robert D. Croll, Westland, and Gerald I. Sinclair, Livonia, both of Mich., assignors to Micromatic Hone Corporation, Detroit, Mich.
Filed June 17, 1969, Ser. No. 833,928
Int. Cl. B24b *9/02*
U.S. Cl. 51—338 **5 Claims**

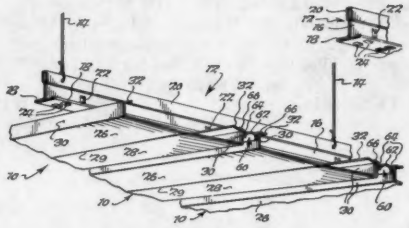
In an abrading or honing tool environment, a resilient material, such as epoxy, urethane, cement, cork, neoprene or synthetic substance is applied between the abrasive means

and the abrasive holder, or between the abrasive holder and the expander, or between the expander and the cone means,



or any combination thereof, to reduce shock and decrease chatter.

3,645,051
CEILING STRUCTURE
Frank S. Kolesar, 18 Preston Drive, St. Catharines, Ontario, Canada
Filed Oct. 24, 1969, Ser. No. 869,062
Int. Cl. E04b *5/52*
U.S. Cl. 52—28 **16 Claims**



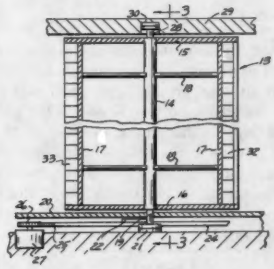
A ceiling structure comprising a plurality of laterally spaced, elongated panel members of generally channel-shaped cross-sectional configuration having inturned flanges that are snap fitted into interlocking engagement behind tabs struck out from the flanges of laterally spaced support carriers extending generally at right angles to the panel members. Certain of the panel members between the spaced support carriers may be deleted to provide one or more openings to receive lighting, heating, ventilating fixtures and the like to form a generally continuous and integrated ceiling system.

3,645,052
MODULAR BUILDING STRUCTURES AND CERTAIN MOVABLE COMPONENTS THEREFOR
Paul R. Hanna, Stanford, Calif., assignor to Vantrex, Stanford, Calif.
Filed Sept. 16, 1970, Ser. No. 72,612
Int. Cl. E04b *1/344*
U.S. Cl. 52—64 **11 Claims**

A system of modular building construction employing prefabricated wall and floor components which can be mass manufactured and assembled at a factory or at the building site to form a variety of completed building shell patterns which may be arranged to form single or multiple shell units on level or sloping terrain or stacked to form multiple story buildings. Such dwelling units or shells include mechanical means for covering the exterior window or door wall openings occurring between the assembled wall components

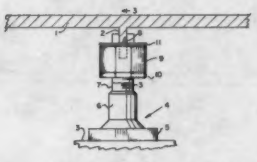
by moving parts of the exterior of the building to cover the openings in order to vandalproof the building.

3,645,053
SWIVEL-SECTIONED BUILDING WALL
George Taggart, 2233 Holcomb No. 12, Detroit, Mich.
Filed Feb. 9, 1970, Ser. No. 9,605
Int. Cl. E04b *1/346;* **E05f** *17/00*
U.S. Cl. 52—65 **1 Claim**



A building wall formed of a number of swivelably mounted sections, normally arranged end-to-end to form a solid wall of monolithic appearance, with means for simultaneously swiveling the sections transversely to the plane of the wall about vertical axes for opening the entire wall.

3,645,054
ADJUSTABLE LEVELING DEVICE
Paul S. Olvera, 2714 Witters St., Saginaw, Mich.
Filed Dec. 22, 1969, Ser. No. 886,942
Int. Cl. E04b *5/00*
U.S. Cl. 52—126 **7 Claims**



An adjustable device for leveling floors, bases and other structures and having a cylindrical, elongate, threaded body supported at one end in an upright position and having at least one diametral slot in its other end of such width as to

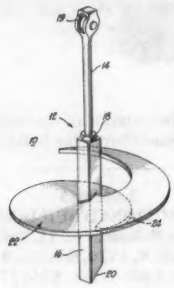
accommodate a flange formed on the structure to be leveled. An adjustable nut is threaded on the body between the ends of the latter and is adjustable toward and away from the slotted end of the body so as to vary the effective depth of the slot. Bearings preferably are supported in a retainer atop the adjusting nut to eliminate friction between the nut and the flange.

3,645,055

SCREW ANCHOR

Kenneth Ralph Roza, Chicago, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Dec. 28, 1970, Ser. No. 101,623
Int. Cl. E02d *5/74*
U.S. Cl. 52—157 **6 Claims**



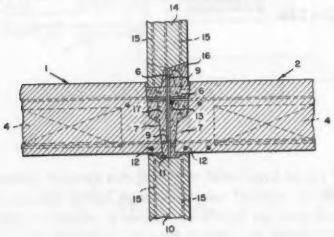
A screw anchor for use in securing a guy wire to the ground includes a shaft with a shank portion having a pointed end for insertion into the ground and a rod extending from the other end of the shank portion to which the guy wire can be attached. Affixed to the shank portion is at least one generally helical cutting blade with a spiral cutting edge so that an obstructing force exerts a constant torsional moment on the shaft of the screw anchor regardless of the position at which the force strikes the cutting edge as the screw anchor is installed into the ground.

3,645,056

CONNECTING HORIZONTAL PANELS AND VERTICAL PANELS IN PREFABRICATED BUILDINGS

Luciano Gerola, Milan, Italy, assignor to Construzioni Generali Fazsura-Cogelar S.p.A., Milan, Italy

Continuation of application Ser. No. 635,445, May 2, 1967, now abandoned. This application Mar. 26, 1969, Ser. No. 814,506
Claims priority, application Italy, May 3, 1966, 10068/66
Int. Cl. E04b *2/10, 5/02*
U.S. Cl. 52—259 **6 Claims**



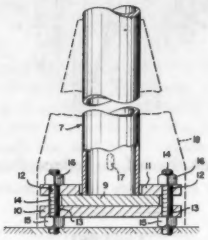
The invention concerns a structure of connected horizontal panels and vertical panels in prefabricated buildings, wherein the horizontal panels bear on protrusions on the underlying vertical panel and in the masonry filled joint all the structural irons are bound together and welded.

3,645,057

BASE FOR MOUNTING A TRAFFIC LIGHT POLE IN ROTATABLE AND VERTICALLY ADJUSTABLE RELATION

Seymour M. Kaplan, 1478 Prospect Ave., East Meadow, N.Y.

Filed Oct. 13, 1970, Ser. No. 80,408
Int. Cl. E02d *27/42*
U.S. Cl. 52—295 **2 Claims**



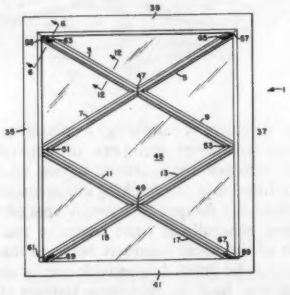
According to this invention, poles for carrying traffic control signals or the like are provided at their lower ends with outstanding flanges which are gripped between opposed clamping elements adjustable on upstanding anchor bolts on the base structure.

3,645,058

MULLION DEVICE FOR WINDOW

Allan I. Jacobson, 48-6 Woodlake Rd., North Albany, N.Y.,, and Philip J. M. Fisher, 81 Fairfield Ave, Albany, N.Y.

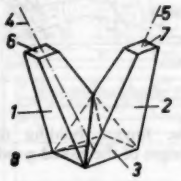
Filed Mar. 7, 1969, Ser. No. 805,164
Int. Cl. E04b *1/48, 1/58*
U.S. Cl. 52—456 **36 Claims**



A removable mullion device or grill, for use with a single-light window to simulatively convert same to multiple light, fabricated of hollowed-out mullion tubes which can be joined together to make selectively variable patterns and sizes utilizing cross-joint connectors for the intersecting angular joints of the mullion tubes, utilizing inserting members for fastening the mullion tubes at the corners of the sash and with the cross-joint connectors, angle-joint connectors and inserting members being received and carried interiorly of the mullion tubes. Also discloses two methods of heat bonding to structurally bond and unite the connectors with the plastic mullion tubes to make permanent cross joints and angle joints. Also discloses bevel cutting of the mullion tubes for cam or wedge locking of the mullion tubes with the window sash. Also discloses an adaptation of the cross-joint connectors for use with runners of a suspension grid for ceilings to form a

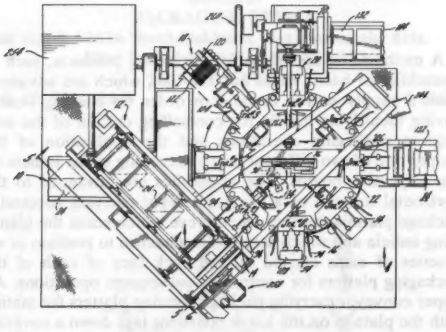
variety of diamond-shaped patterns. Also discloses an adaptation of the cross-joint connectors, and the use of a cross-joint connector with a T-joint connector, for geodesic structure.

3,645,059
CONSTRUCTIONAL ELEMENT
Wilhelm Grimm, Robert-Koch-Strasse 10, 608 Gross-Gerau-Dornheim, Germany
Filed Feb. 26, 1970, Ser. No. 14,512
Claims priority, application Germany, Feb. 26, 1969, P 19 09 647.0
Int. Cl. E04b 2/12
U.S. Cl. 52—609 **10 Claims**



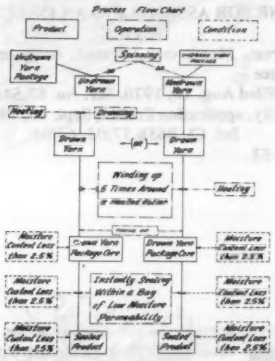
Especially shaped constructional element for the assembly of light partition walls in gardens, parks, recreation grounds, in restaurants, or terraces and other similar sites. The building stone is composed of at least two frusta of cones or pyramides having axes inclined to each other.

3,645,060
CONTAINER LOADER FOR COMPRESSIBLE PRODUCT
Philip G. Hammond, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed July 6, 1970, Ser. No. 52,509
Int. Cl. B65b 63/02, 13/20
U.S. Cl. 53—24 **19 Claims**



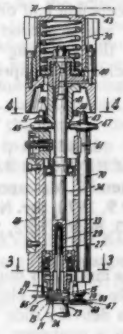
A method and apparatus for packing a stack of compressible material, such as disposable diapers, into a carton wherein the apparatus includes a rotatable turret which is serially indexed to a number of stations. The compressible stack is loaded between a pair of platens which rotate with the turret and the stack is compressed to the desired height, with the rotational movement of the turret causing the platens to move relative to each other for compression. After the stack has been compressed to the desired level, a carton is placed over the platens and the stack at one station; and, at a further station, the diapers are pushed out from between the platens so that the carton is also thereby moved and the stack is contained in the carton. Provision is also made for placing a coupon or sheet containing advertising, instructions or the like, into the carton in such a fashion that the coupon is not damaged and for pushing the carton over the platens with a straight line pushing motion to insure proper container alignment and to allow motion with a minimum applied force.

3,645,061
METHOD FOR MANUFACTURING AN IMPROVED POLYCAPROAMIDE FILAMENT YARN BY SEALING A PACKAGE IN A BAG
Shigeru Mizutani; Kunio Sumi, and Shinji Ando, all of Aichi-ken, Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Filed Jan. 30, 1969, Ser. No. 795,155
Int. Cl. B65b 31/00, 63/08, 55/04
U.S. Cl. 53—25 **1 Claim**



A method for manufacturing an improved polycaproamide filament yarn by sealing a package thereof in a bag made of a film of a low moisture permeable thermoplastic synthetic polymer and its product. Oozing out of monomers or oligomers on the surface of the yarn due to high relative humidity during long storage can be effectively prevented.

3,645,062
CONTAINER-CAPPING APPARATUS
Charles N. Hannon, 27 Sargent Road, Scarsdale Westchester, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,458
Int. Cl. B65b 7/28
U.S. Cl. 53—42 **21 Claims**



The apparatus concerns a container-capping device. A cap section having a flattened region covering the containcr

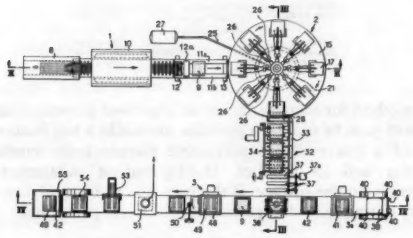
mouth is provided with a downwardly depending skirt having at approximately its lower end a series of elongated openings which are joined at their ends by bridge sections. Provisions are made for both deforming the cap at its outer periphery to bring it into abutment with the container wall and also to provide for scoring the bridge sections through a suitable scoring means with the container and the scoring means adapted to be turned relative to each other so that the scoring covers all peripheral bridge regions. The containers to which this description will be primarily related for illustrative purposes can be considered as bottles with a prethreaded outer end section between the mouth and shoulder regions. Provisions are made so that the cap member may either be prethreaded to the container outer section or whereby the cap may be deformed to complement the bottle formation of threads.

3,645,063

MACHINE FOR ASSEMBLING AN INSECTICIDAL DEVICE

Jacques Foirest, Monfermeil, France, assignor to L'Oreal, Paris, France

Filed Aug. 10, 1970, Ser. No. 62,546
Claims priority, application France, Sept. 16, 1969, 6931461
Int. Cl. B65b *57/02, 63/08*
U.S. Cl. 53—53 **17 Claims**



Machine for impregnating absorbent sheets and inserting them in receptacles comprises a conveyor passing said sheets through an oven to dry them, a rotating table carrying a plurality of presses for receiving and impregnating the dried sheets, and an assembly line comprising a conveyor belt, means for placing a receptacle half on the belt, followed by an impregnated sheet and a second receptacle half, and means for squeezing the resulting stack to produce a complete receptacle enclosing an impregnated sheet.

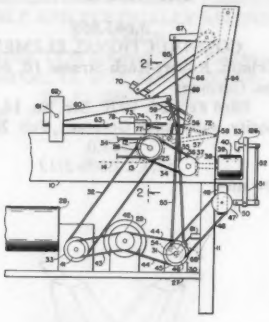
3,645,064

PACKING MACHINE FOR BAKED GOODS

Fred L. Waite, 66 Clinton Pl., Massapequa, N.Y.

Filed July 9, 1970, Ser. No. 53,489
Int. Cl. B65b *57/02, 57/10*
U.S. Cl. 53—55 **14 Claims**

Baked goods, such as muffins or donuts, are received from a belt onto a cyclically operated elevator which raises the goods to the level of a delivery slide from which the baked goods are pushed into a container. If the machine cycles twice for each container, the baked goods are stacked two high therein. To ensure that the goods are disposed flat within the container, pivotally mounted gravity biased fingers are mounted on the mechanism pushing the baked goods



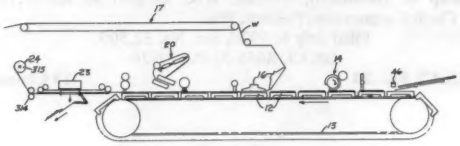
from the slide, the fingers holding down and urging downward the rear edges of the baked goods.

3,645,065

PACKAGING MACHINE

Hans A. Jensen, Madison, and Melvin M. Layman, Waunakee, both of Wis., assignors to Oscar Mayer & Co., Inc., Madison, Wis.

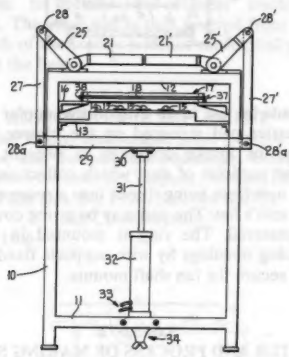
Filed Mar. 5, 1970, Ser. No. 16,787
Int. Cl. B65b *57/02, 31/02, 61/26*
U.S. Cl. 53—73 **28 Claims**



A method and apparatus for packaging products, such as assemblies of bacon slices and the like, which are advanced from a supply source in random order on backing boards having identifying indicia for controlling certain of the subsequent packaging operations and the application of the proper one of two different labels according to the indicia on the respective boards. The assemblies are advanced to the horizontal top run of a lower conveyor carrying successive package platters, past an electric eye which scans the identifying indicia and which actuates mechanism to position or set a series of cams carried on the back face of each of the packaging platters for controlling subsequent operations. An upper conveyor carrying package forming platters for mating with the platters on the lower conveyor lays down a covering web and forms vacuumized and sealed packages between pairs of mating platters. The cams control operation of mechanism for applying adhesive to the backing board prior to advance of the boards to the upper conveyor and also a label applying device beyond the upper conveyor which has a dual label supply magazine and an associated adhesive activator and applicator for applying to the packages either of two labels according to the cam setting on the bottom of the platter on the lower conveyor which carries the package. The apparatus includes a platter identification printer and a code dater preceding and following the labeling device. Upon the application of the label, the packages are transferred to the bottom run of an outfeed conveyor having package suspend-

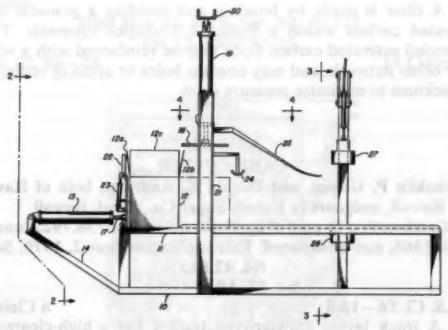
ing pins which carry the connected packages between a vertically reciprocating trimming punch and a cooperating bottom die for severing the packages from the web so as to permit discharge of the separated packages from the apparatus with the waste resulting from the trimming operation being forced loose from the pins and wound on a reel at the end of the outfeed conveyor.

3,645,066
PLASTIC PACKAGING MACHINE WITH MULTISEGMENTED HEATER PLATE
John V. Drygulski, 51 Silver Spring Road, Short Hills, N.J.
Filed Feb. 4, 1970, Ser. No. 8,448
Int. Cl. B65b *31/00*
U.S. Cl. 53—112 A **1 Claim**



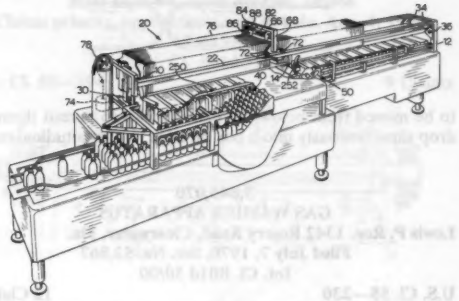
A machine for plastic skin packaging and vacuum forming is provided with a multisegmented heating plate wherein all of the heater segments are moved simultaneously. These segments are desirably hinged and arranged to be raised and lowered from the center of the heating section of the machine.

3,645,067
PACKAGING DEVICE
Phil Siegel, 11636 North Oakhurst Way, Scottsdale, Ariz.
Filed Dec. 4, 1969, Ser. No. 881,952
Int. Cl. B65b *63/00*
U.S. Cl. 53—124 B **1 Claim**



The present invention discloses a packaging machine for sequential packing and securing cartons of cloth material such as rags and waste. The invention includes a novel packing carton for holding the packaged material in the compressed state.

3,645,068
CARTON LOADING MACHINE
Marinus J. M. Langen, Weston, Ontario, Canada, assignor to Consolidated Paper (Bahamas) Limited, Nassau, Bahamas
Filed Dec. 15, 1969, Ser. No. 885,202
Int. Cl. B65b *7/20, 43/30*
U.S. Cl. 53—186 **17 Claims**

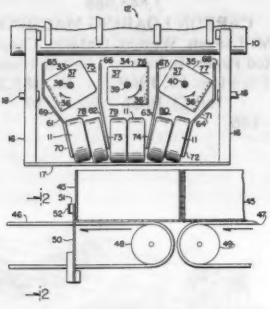


A method and apparatus for loading cartons, particularly end-loading cartons. The method includes improvements in the opening of the carton from the knockdown configuration, the transferring of the carton from the knockdown storage area to a continuously moving conveyor, the loading of the open carton and the closing of the carton. The improved method of opening the carton includes the steps of engaging adjacent sidewalls of the knockdown carton with suction cups and moving the suction cups away from one another along an arcuate path while simultaneously moving the opening carton to a position on the continuously moving belt. The apparatus includes a carton opening apparatus, a carton transfer apparatus for transferring the opening carton into a continuously moving conveyor and closure means for closing the carton after it has been loaded with bottles or the like. The opening apparatus is characterized by oppositely disposed suction cup means which engage oppositely disposed pairs of adjacent sidewalls and a control mechanism for causing the suction cups to move away from one another in an arcuate path to move the adjacent wall of the carton to an open position. The transfer mechanism includes a movable carriage which is adapted to remove a knockdown carton from a storage station and transfer it by way of a two-stage operation onto a continuously moving conveyor. The closing apparatus includes a double-bladed rotor mounted in the path of movement of the ends of the carton after loading. One blade is adapted to close a top or bottom wall and the other blade is adapted to close the trailing wall.

3,645,069
PACKING DEVICE FOR BAKED GOODS
Fred L. Waite, 66 Clinton Pl., Massapequa, N.Y.
Filed July 9, 1970, Ser. No. 53,492
Int. Cl. B65b *35/32*
U.S. Cl. 53—159 **10 Claims**

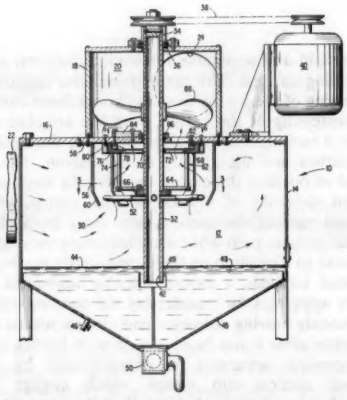
A device for packing baked goods such as donuts in a box has cups into which baked goods are slid to be stacked two

high, the cups being rotated to dump the baked goods on edge in a row on a retaining bar. The retaining bar is pivoted



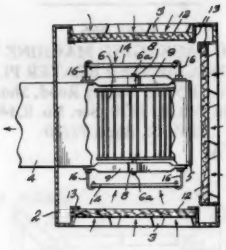
to be moved from below the baked goods to permit them to drop simultaneously into a box on edge in a longitudinal row.

3,645,070
GAS WASHER APPARATUS
Lewis P. Roe, 1342 Rosery Road, Clearwater, Fla.
Filed July 7, 1970, Ser. No. 52,867
Int. Cl. B01d *50/00*
U.S. Cl. 55—230 **12 Claims**



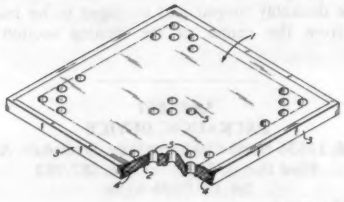
A pollution control device including a lower contaminant collection chamber and an upper plenum chamber. A gas-washing system includes a rotating vertical hollow tube extending through the chambers and having its lower end submerged in a body of liquid provided at the bottom of the collection chamber. Within the collection chamber are a plurality of aspirating spray pipettes extending laterally from the hollow tube and a rotor assembly mounted on the hollow tube just above the pipettes with part of the rotor assembly forming a seal between the upper and lower chambers which forces the gas to flow through the main rotor section in order to pass from the lower to the upper chamber. A plurality of deflectors are mounted adjacent the nozzle ends of the pipettes to diffuse the water emitter from the nozzles into an annular water shroud or spray. This water is deposited on particles deflected by the main rotor section, thereby effectively increasing the mass of the particles and causing them to collect by centrifugal action against the walls of the collection chamber. A fan mounted on the hollow tube in the upper chamber draws cleaned air from the rotor assembly and passes it out to the surrounding atmosphere.

3,645,071
BARRIER PADS FOR EVAPORATIVE COOLERS
Billy C. Gray, 765 De Baca Road, Las Cruces, N. Mex.
Filed Apr. 29, 1970, Ser. No. 32,880
Int. Cl. B01f *3/04*
U.S. Cl. 55—259 **5 Claims**



Barrier pads for use in an evaporative cooler unit consisting of a barrier pad mounted on the blower housing and spaced from its intake openings to prevent droplets of moisture and particles of dust which collect on the cooling pads of the unit from being drawn into a room or the like by the cooling unit's fan. The pad may be a ring covered with an absorbent material. The ring is mounted in front of the blower housing openings by wire supports fixed on the stud bolts which secure the fan shaft mounts.

3,645,072
FILTER AND PROCESS OF MAKING SAME
Thomas Miller Clapham, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.
Filed Jan. 9, 1970, Ser. No. 1,772
Int. Cl. B01d *53/02*
U.S. Cl. 55—387 **8 Claims**

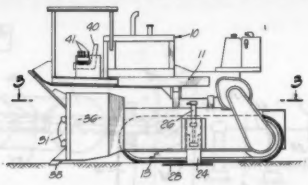


A filter is made by bonding and molding a granular activated carbon within a frame of U-shaped channels. The bonded activated carbon body may be reinforced with a wire or other network, and may contain holes or areas of reduced thickness to minimize pressure drop.

3,645,073
CANE CUTTER
Franklin P. Gomes, and Donald K. Andrews, both of Hawi, Hawaii, assignors to Kohala Sugar Co., Hawi, Hawaii
Continuation-in-part of application Ser. No. 736,792, June 13, 1968, now abandoned. This application June 2, 1970, Ser. No. 42,845
Int. Cl. A01d *45/10*
U.S. Cl. 56—13.8 **6 Claims**

A track laying crawler-type tractor has a high-clearance frame to define a throat between the crawler tracks of sufficient height and width to pass over two rows of sugarcane growing as a mat in the field and ready to harvest. Cutting means are connected to the frame to sever both rows of cane from the ground. Additional cutting means on the frame ex-

tending outward from the crawler tracks may also be provided to sever additional rows of growing cane. A power-driven upright rotary knife in front of each crawler track at the side boundaries of the threat serves to divide the mat of



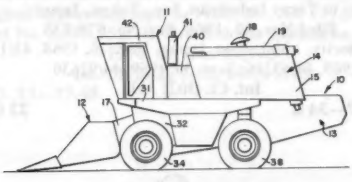
growing cane to permit the crawler tracks to pass therethrough. The cane mat is thus severed from the ground along the path of the tractor without substantially disturbing its position in the field.

3,645,074

AGRICULTURAL IMPLEMENT

Vernon Eugene Rettig, Bondurant; John Edward Maust, Jr., Des Moines, and Joseph John Shindelar, Ottumwa, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 26, 1970, Ser. No. 83,751
Int. Cl. A01d *45/02*
U.S. Cl. 56—14.6 **35 Claims**



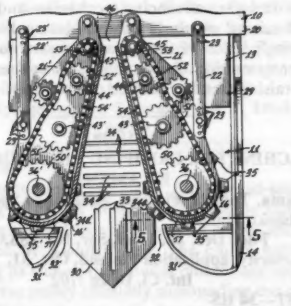
A crop-treating device composed of an elongated fore-and-aft extending crop-treating implement and an implement carrier that bridges over the implement and has sides extending alongside the implement sides. Supporting couplers connect the carrier sides to the implement sides with the rear portion of the carrier being adapted for vertical movement for coupling and uncoupling to the implement.

3,645,075

DEVICE FOR HARVESTING RANDOMLY GROWN PLANTS

Benjamin Oscar Kappelman, 1042 E. Campus, and Marion I. Vance, Route 2 Box 550 Kyrene Drive, both of Tempe, Ariz.

Filed May 22, 1970, Ser. No. 39,727
Int. Cl. A01d *45/18*
U.S. Cl. 56—28 **10 Claims**



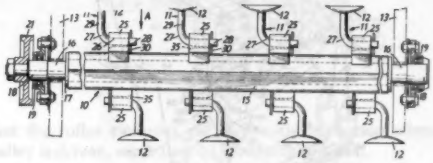
An accumulator for mounting on the front end of a harvester for harvesting randomly grown plants in strips of a predetermined width wherein the accumulator comprises a pair of plant-gathering arms adapted to astride and collect between them a given patch of plants. A platform mounted below the arms is provided with a protrusion extending forwardly of the accumulator between the arms for defining with each arm a plant passageway. A shaft having mounted on it a knife is rotated adjacent one of the passageways for cutting some of the plants as they pass through the accumulator. The remainder of the plants are uncut and support in upright position the cut plants.

3,645,076

FLAIL MOWER

Edward John Aldred, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, Ipswich, Suffolk, England

Filed Mar. 20, 1970, Ser. No. 21,366
Claims priority, application Great Britain, Apr. 1, 1969, 17,043/69
Int. Cl. A01d *55/20*
U.S. Cl. 56—294 **9 Claims**



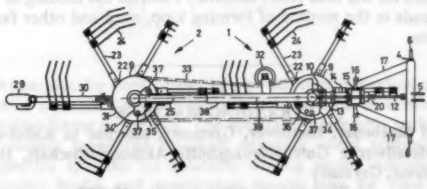
A flail mower has cutting blades suspended by flail rods from a horizontal rotatable shaft. The center portion of each rod is curved through 90° to form a radial arm and a pivot arm at opposite ends of the rod. The pivot arm is a close sliding and rotational fit in an aperture in a lug on the shaft, the axis of the aperture being parallel to the axis of the shaft. The pivot arm is located in position by a detachable spring clip on the distal end of the pivot arm, so that the flail rod and blade can be removed from the shaft by detaching the clip and sliding the pivot arm end of the rod out of the aperture. The radial arm extends through an aperture in the cutting blade and is formed with an enlarged head which retains the blade on the arm when subjected to centrifugal force upon rotation of the shaft. The blade is slidable along the radial arm and then along the pivot arm for removal from the rod when the rod is removed from the shaft.

3,645,077

HAYMAKING MACHINE

Hans Ulrich Hauser-Lienhard, Watt, Zurich, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Zurich, Switzerland

Filed Aug. 14, 1969, Ser. No. 850,045
Claims priority, application Switzerland, Aug. 27, 1968, 12824/68
Int. Cl. A01d *79/02*
U.S. Cl. 56—366 **7 Claims**



A haymaking machine having two rake wheels mounted for rotation about vertical shafts at both ends of an arm pivotable in a horizontal plane, both rake wheels being supported by ground wheels. The first of said rake wheels is stationary with respect to the line of travel of the machine and the second rake wheel arranged in the rear of the first wheel, can be shifted laterally by means of said pivotable arm

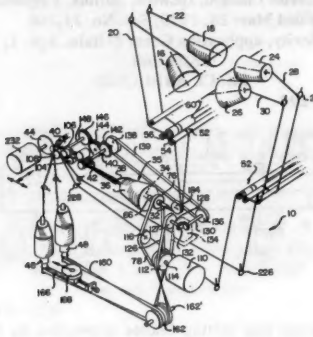
towards one or the other side of the line of travel of the machine with respect to said first wheel and can be locked in its lateral shifted position.

3,645,078

APPARATUS AND METHOD FOR THE PRODUCTION OF FANCY YARNS, SUCH AS CHENILLE

Charles E. Roberts, Union, S.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Aug. 25, 1969, Ser. No. 852,675
Int. Cl. D02g *3/42*
U.S. Cl. 57—24 **20 Claims**



A device for the production of fancy or fluffy yarns, such as chenille, has a frame along the length of which a plurality of individual forming units are spacedly mounted, each unit including a spindle and forming arrangement for delivering warp threads bound by encircling weft threads to a roller arrangement which also receives binder threads from a creel on the frame and which has an associated rotary knife that severs the weft threads with the warp and binder threads, having the cut weft threads thereon, being taken up on a pair of takeup spindles of a ring-spinning frame. A main drive means is provided for each unit and is drivingly connected through separate transmission means with the spindle and forming arrangement, the associated roller arrangement and the associated pair of takeup spindles with each drive transmission means being adjustable for coordinated operation of such components. A separate drive means is provided for each knife which is adjustable relative to its associated roller arrangement. The twisted threads are conveyed from the spindle and forming arrangement to the roller arrangement by a feed roller assembly which is driven by the drive means for the spindle arrangement. A selectively actuatable control means for the feed roller assembly controls the feeding of the threads in the method of forming loop, seed and other fancy yarns.

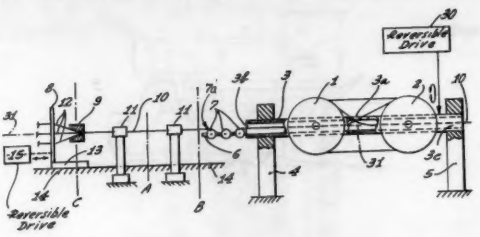
3,645,079

STRANDING MACHINE

Rolf Stoebener, Hannover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed May 8, 1970, Ser. No. 35,857
Claims priority, application Germany, May 12, 1969, P 19 24 093.4
Int. Cl. H01b *11/04, 13/04*
U.S. Cl. 57—34 AT **4 Claims**

An accumulator stranding machine for twisting strands at a reversing twist, wherein the stranding nipple moves in unison with the strands, towards the accumulator whenever the accumulator changes speed; the stranding nipple moves in the opposite direction during regular rotation of the accumulator.

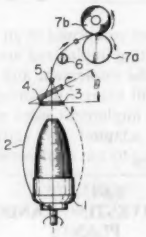


3,645,080

APPARATUS AND METHOD FOR MANUFACTURING A FLUFFY YARN

Selichi Yamagata; Masaaki Sakai; Toshimoto Matsubara, all of Otsu-shi, and Shigeji Yamashita, Koga-gun, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 21, 1969, Ser. No. 878,835
Claims priority, application Japan, Nov. 26, 1968, 43/102555; July 5, 1969, 44/63216; Sept. 30, 1969, 44/92630
Int. Cl. D02j *3/02*
U.S. Cl. 57—34 R **23 Claims**



An apparatus for manufacturing a fluffy yarn used in combination with a yarn-advancing mechanism and having one or more fluff-raising members axially rotational in contact with a ballooning portion of the advancing yarn for partially and intermittently cutting fibrous materials composing the yarn. The fluff-raising member may be rotated positively.

3,645,081

MACHINE FOR CRIMPING THERMOPLASTIC FILAMENT

Risto Salama, Tapiola, Finland, assignor to Spinner Osakeyhtio, Helsinki, Finland

Filed Dec. 24, 1969, Ser. No. 888,012
Claims priority, application Finland, Oct. 31, 1969, 3135/69
Int. Cl. D02g *1/02*
U.S. Cl. 57—34 HS **6 Claims**

The invention relates to a machine for crimping thermoplastic filament, in which the filament is conducted from a

spool over a first thread guide through a thread-drawing device, through a second thread guide, through a heating

oven, then through a false twister rotating about its axis, and finally over another thread-drawing device onto a spool.

3,645,082

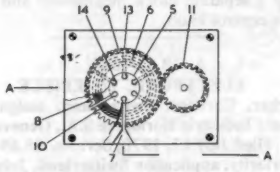
APPARATUS FOR FALSE TWISTING YARN

Bruce Murray McIntosh, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Original application Sept. 3, 1968, Ser. No. 757,077, now Patent No. 3,553,952. Divided and this application Aug. 18, 1970, Ser. No. 64,763

Int. Cl. D02g *1/02*; D01h *7/92*

U.S. Cl. 57—77.45 **5 Claims**



A false twist device having a plurality of guides on a guide plate rotatable about an axis and said guide plate being mounted in bearings which have a radius larger than the guide plate.

3,645,083

SPINDLE-MOUNTING ASSEMBLY FOR THREAD-SPINNING OR THREAD-TWISTING MACHINES

Theo Lohring, Bentheim; Aloys Greive; Heinrich Eckholt, both of Munster, and Theodor Tiemann, Bosensell/Munster, all of Germany, assignors to Hamel GmbH Zwirnerei-und Spinnereimaschinen, Munster, Westf., Germany

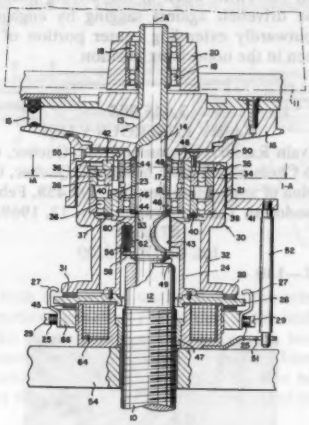
Filed Jan. 5, 1970, Ser. No. 603

Claims priority, application Germany, Jan. 7, 1969, P 19 00 607.6

Int. Cl. D01h *7/08, 1/24, 7/22*

U.S. Cl. 57—88 **11 Claims**

A spindle-mounting assembly for thread-spinning or thread-twisting machines in which the spindle shaft is journaled about an upright axis in a bearing sleeve and is coaxially surrounded by a clutch bell. The clutch bell is spring biased to bring its transverse annular clutch face into engagement with a drive pulley coaxially surrounding the clutch bell but may be drawn downwardly by an electromagnet surrounding the bearing sleeve to engage a brake face. Between the cylindrical sleeve of the clutch bell and the drive pulley there is provided a fixed boss or sleeve to which the inner race of the outer roller or ball bearing system is affixed so



that the roller elements are constantly in motion when the pulley is driven, regardless of the clutch position.

3,645,084

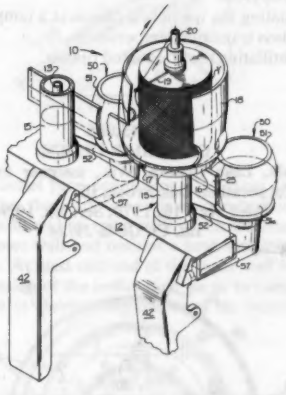
APPARATUS FOR CONTROLLING THE OPERATION OF INDIVIDUAL SPINDLES IN A YARN-PROCESSING MACHINE

Klaus Nimtz, Krefeld, Germany, assignor to Palitex Project Company GmbH, Krefeld, Germany

Filed Aug. 28, 1970, Ser. No. 67,739

Int. Cl. D01h *13/14, 7/22*

U.S. Cl. 57—88 **7 Claims**



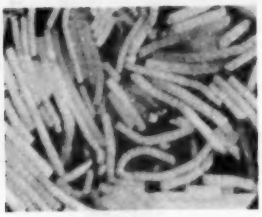
Apparatus for controlling the operation of individual spindles in a textile yarn-processing machine, such as a twister, spinning frame or the like. The apparatus preferably includes an endless tangential drivebelt engaging whorl portions of respective spindles for rotatably driving same, individually operable brake and positioning means may be used for stopping the rotation of and for positioning desired ones of the spindles in predetermined positions, and individually movable tension rolls for guiding engagement with the drivebelt to individually assume a driving position holding the drivebelt in tight frictional engagement with the respective spindle and to be movable to a substantially nondriving position holding the drivebelt in loose friction engagement with

the respective spindle for allowing operation of the brake and positioning means. Preferably, the tension rolls include bowed peripheral surfaces for holding the drivebelt by full engagement therewith when in the driving position and for holding the drivebelt against sagging by engagement with only the outwardly extending center portion of the bowed surface when in the nondriving position.

3,645,085
HAIRY LUSTROUS YARN

Nestor Sylvain Rassart, Drummondville, Quebec, Canada, assignor to Chemcell Limited, Montreal, Quebec, Canada

Continuation of application Ser. No. 709,458, Feb. 29, 1968, now abandoned. This application Nov. 13, 1969, Ser. No. 871,648
Int. Cl. D02g 3/00
U.S. Cl. 57—140 **1 Claim**



A hairy lustrous yarn of isotactic polypropylene which has a rectangular cross section and a luster index above 2.

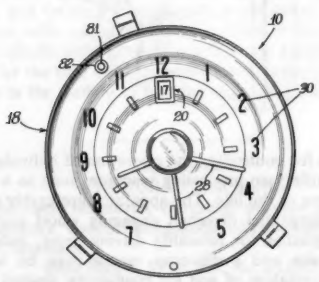
The method of making same which comprises:

a. melt extruding a melt-extrudable isotactic polypropylene blend in the form of a ribbon.
b. immediately gas quenching the ribbon to a temperature above the glass transition temperature of isotactic polypropylene.
c. attenuating the quenched ribbon at a temperature above said glass transition temperature.
d. gas fibrillating the attenuated ribbon.

3,645,086
CALENDAR CLOCK

Emil Niznik, Lake Geneva, Wis., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Mar. 16, 1970, Ser. No. 19,905
Int. Cl. G04b 19/24
U.S. Cl. 58—4 **9 Claims**

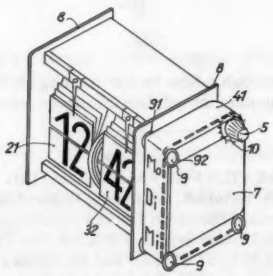


A calendar clock having a dial bearing indications of 31 days of the month, with one day indication exposed, and clockwork advancing the dial every 24 hours in an arrangement including a lever and ratchet means working on the dial, and the clock including a manual pushbutton which when depressed actuates the lever and advances the dial, independently of the clockwork and without interfering with the connection between the clockwork and the dial, to enable the dial to be advanced after the end of a short month to properly indicate the days of the next month.

3,645,087
DIGITAL CLOCK WITH ADDITIONAL DATA INDICATION

Dieter Rams, Konigstein, Taunus, and Claus Christian Cobarg, Steinbach, Taunus, both of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 11, 1970, Ser. No. 36,250
Claims priority, application Luxembourg, May 20, 1969, 58675
Int. Cl. G04b 19/24
U.S. Cl. 58—6 A **12 Claims**

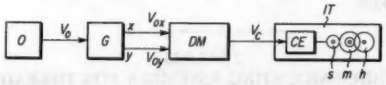


The clock comprises a combination of a time indicator in the form of a digit-bearing tilting plates system and an additional data indicator in the form of an endless belt that is disposed adjacent to the tilting plates time indicator. The belt is driven by a separate clock mechanism and manually adjustable by a control knob.

3,645,088
ELECTRONIC TIMEPIECE

Jakob Luscher, Carouge, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere S.A., Geneva, Switzerland

Filed July 17, 1970, Ser. No. 55,695
Claims priority, application Switzerland, July 18, 1969, 11006/69
Int. Cl. G04c 3/00
U.S. Cl. 58—23 A **3 Claims**



An electronic timepiece which comprises a time standard that delivers a periodic signal of predetermined frequency, an electronic divider, an electromechanical converter controlled by the divider, time display means actuated by the converter, a two-phase voltage generator controlled by the time standard and a two-phase network supplied by the generator, the various stages of the divider being associated with one or the other of the network phases.

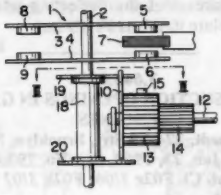
3,645,089
INTERMITTENT DRIVING MECHANISM FOR TIMEPIECE

Asahiro Yamada, 2-3-2, Kakinokisaka, Meguro-ku, Japan

Filed May 28, 1970, Ser. No. 41,256
Claims priority, application Japan, May 28, 1969, 44/48672
Int. Cl. G04c 3/04; G04b 27/00
U.S. Cl. 58—28 D **5 Claims**

An intermittent driving mechanism for timepieces, comprising a balance, a driving wheel having an odd number of

teeth, and two impulse plates provided on the balance and disposed in an axially spaced relation on diametrally opposite sides of the driving wheel for causing intermittent rotation of said driving wheel by alternately striking teeth on the driving



wheel, whereby each intermittent rotative motion of the driving wheel brings two adjacent teeth of the driving wheel into contact with the last striking plate, thereby obstructing the free rotation of said driving wheel, and stopping the driving wheel until a tooth is struck by the other plate.

3,645,090

DAY-DATE QUICK-ADJUSTER FOR CALENDER TIMEPIECE

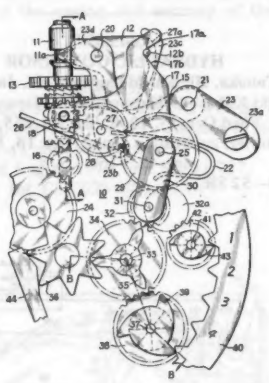
Yoshifumi Mochizuki, and Akira Tsuzuki, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 19, 1970, Ser. No. 47,701

Claims priority, application Japan, June 19, 1969, 44/48443; 44/58167

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **9 Claims**



The calendar correction mechanism for use with a calendar timepiece having a date and a day calendar dial operable independently from each other is operable by the manually rotatable winding stem.

The correction torque transmitting arrangement is so designed that by turning said stem in one direction both calendar dials are rotated for correction in unison with each other and by turning the stem in the opposite direction only one of the dials is rotated independently from the other and in the same direction as before when the stem was rotated in said one direction.

3,645,091

GUN-TYPE DEVICE FOR MECHANICAL ASSEMBLY WORK UTILIZING ENERGY OF EXPLOSION

Valery Vasilievich Ivanov, ulitsa Poltavskaya, 10, kv. 6, and Valentin Ivanovich Rumyantsev, ulitsa Sedona, 44, kv. 6, both of Leningrad, U.S.S.R.

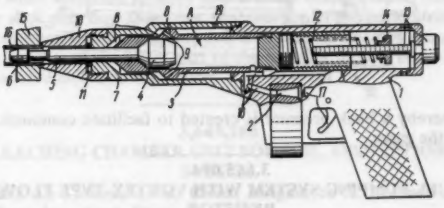
Filed Aug. 17, 1970, Ser. No. 64,264

Int. Cl. F01b *29/08*

U.S. Cl. 60—26.1 **1 Claim**

A gun-type device for mechanical assembly work utilizing the energy of explosion.

The device comprises a second barrel secured on the body around the first barrel, the latter being installed with a provision for axial movement and has a circular projection functioning as a piston while the first barrel is moving in the second one, and has channels which intercommunicate the



spaces of both barrels and are located at the side of the circular projection facing the rod so that at the end of the forward stroke of the piston with the working tool the compressed gases flow from the space of the first barrel into that of the second one as a result of which the first barrel moves and returns the piston with the tool to the initial position.

3,645,092

TEMPERATURE COMPENSATING CONNECTION BETWEEN EXHAUST PURIFIER AND PIPE

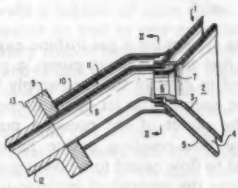
Yasuo Tatsutomi, and Yoshihiro Kajihara, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 1, 1970, Ser. No. 24,572

Claims priority, application Japan, Apr. 4, 1969, 44/30927; Jan. 14, 1970, 45/4735

Int. Cl. F16l *21/00;* **F02b** *75/10*

U.S. Cl. 60—29 **5 Claims**



A reactor outlet pipe connecting a reaction chamber and an exhaust pipe, that is of a multilayer construction comprising an inner wall and an outer wall which surrounds the outside of the inner wall and defines a heat insulation chamber therebetween. At least one end of the inner wall is slidable in the axial direction of the outlet pipe, so as to compensate for the difference in thermal expansion of the inner and outer walls.

3,645,093

AIR POLLUTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

William L. Thomas, 146th & Calumet Expressway, Calumet City, Ill.

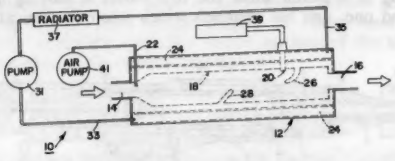
Filed Feb. 5, 1970, Ser. No. 8,774

Int. Cl. F01n *3/14*

U.S. Cl. 60—30 **10 Claims**

Pollution control system for an internal combustion engine includes a combustion chamber assembly having a combustion chamber and an igniter in the chamber to burn the exhaust gases from the engine. Air is pumped to the gases in the chamber and a cooling chamber surrounds the combustion chamber for cooling purposes. An upstanding baffle in the combustion chamber imparts an upwardly swirling mo-

tion to the exhaust gases to direct them against a depending arch having a cavity therein for receiving the swirling gases,



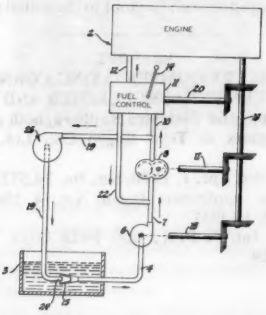
whereby a back pressure is created to facilitate combustion of the gases.

3,645,094

FUEL-PUMPING SYSTEM WITH VORTEX-TYPE FLOW RESISTOR

Alfred M. Suggs, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 4, 1970, Ser. No. 43,346
Int. Cl. F02c *9/10*
U.S. Cl. 60—39.28 **5 Claims**



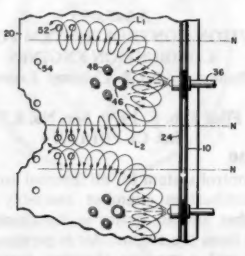
A fuel-pumping system for a gas turbine engine includes a jet pump in the fuel tank, a boost pump, a pressure pump, and a fuel control to control the fuel supply from the pressure pump to the engine. The jet pump is energized by fuel diverted from the outlet of the pressure pump through a static vortex-type flow-resisting device having a pressure drop proportional to flow raised to a power greater than two. This device reduces the amount of increase in fuel returned to the jet pump which would otherwise occur under high-pressure discharge conditions of the pressure pump.

3,645,095

ANNUALR COMBUSTOR

Jerry O. Melconian, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Nov. 25, 1970, Ser. No. 92,808
Int. Cl. F02c *3/24*
U.S. Cl. 60—39.36 **9 Claims**



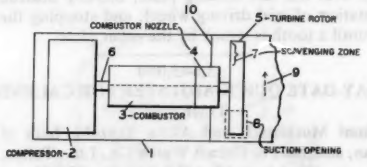
The disclosure illustrates an improved annular combustor having directional air inlets near the head end of the combustor tending to establish a vortex flow of combustion gases adjacent the combustor fuel nozzles. A series of jets downstream of the fuel nozzles reinforce the vortex flow of gases and deflects it into a horseshoe shape having legs generally parallel to the axis of the annular combustor. Cancelling jets downstream of the deflecting jets terminate the vortex flow and dilute it.

3,645,096

PERIPHERAL SUCTION OPENINGS IN GAS TURBINE ENGINES

Georg S. Mittelstaedt, 274-73 Str., Brooklyn, N.Y.

Filed Jan. 23, 1969, Ser. No. 793,490
Int. Cl. F02c *3/06;* **F02k** *3/02*
U.S. Cl. 60—39.66 **11 Claims**



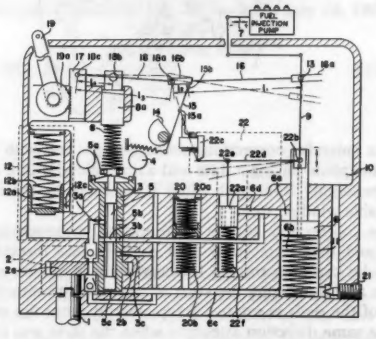
This invention relates to partial admission gas turbine engines. A gas turbine with partial admission generally comprises a compressor, a combustor, a casing, and a bladed turbine rotor disposed in the casing.

3,645,097

HYDRAULIC GOVERNOR

Noritoshi Tanaka, Higashi-Matsuyama-shi, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1969, Ser. No. 865,698
Claims priority, application Japan, Oct. 18, 1968, 43/75572
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 SR **7 Claims**



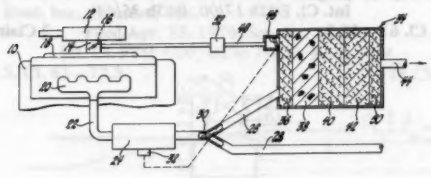
A hydraulic governor wherein a power piston is actuated only by oil pressure a gear pump in a fuel increasing direction and by a power spring in a fuel decreasing direction. A speed regulating lever is operatively connected to a speeder lever which is engaged with a floating lever which includes a mediate fulcrum and variable lever ratio. The speeder lever is interlocked to a link connected to the power piston. A load-limiting piston is adapted to open and close a path passing through the pressure side of the power piston and gear pump.

3,645,098

EXHAUST EMISSION CONTROL

Robert J. Templin, Bloomfield; Paul R. Johnson, Metamora, and Robert F. Falberg, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1970, Ser. No. 75,834
Int. Cl. F01n 3/14
U.S. Cl. 60—30 R 14 Claims



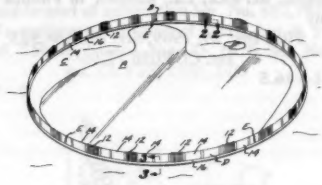
Internal combustion engine exhaust gases, passing unreacted through an exhaust gas catalytic or thermal reaction device during the warmup period of the device, are directed to an expansible container which retains the entire flow of exhaust gases or to a container of filter, adsorptive and absorptive material which retains undesirable constituents of the exhaust gases. After warmup of the reaction device, the retained gases or constituents are recirculated to the engine induction system or the reaction device. This approach supplements the emission control of the reaction device by preventing emission of undesirable exhaust gas constituents during starting of the engine and warmup of the reaction device.

3,645,099

BUOYANT OIL SLICK RETAINING STRUCTURE

Manuel Saavedra, San Pedro, Calif., assignor to Roberto Aldana, San Pedro, Calif., a part interest

Filed Aug. 6, 1970, Ser. No. 61,727
Int. Cl. E02b 3/04, 15/04
U.S. Cl. 61—1 F 7 Claims



A number of elongate rectangular panel structures that may be removably connected to one another in end-to-end relationship to be extended around an oil slick floating on the surface of a body of water to confine the slick. Each of the panel structures includes an elongate rectangular pliable sheet of double thickness that has two elongate longitudinally extending buoyant members disposed on opposite sides thereof and secured thereto at positions intermediate the top and bottom thereof. The buoyant members cause a substantial section of the sheet to extend above the body of water and serve as a barrier to confine the oil slick floating thereon.

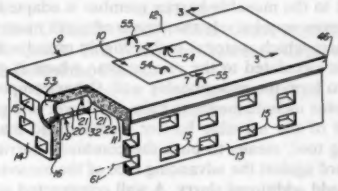
Each of the panel structures has at least one intermediately disposed section that is of accordianlike structure that has a number of vertically disposed stiffeners included as a part thereof, which stiffeners serve to maintain the section in a substantially vertically disposed position when the section is floating on a body of water. The intermediate sections due to the accordianlike structure thereof, permit sheet sections on opposite sides thereof to shift vertically when subjected to wave action. Due to the above described construction of the panel sections, the panel structures not only tend to remain in a substantially vertical position when floating, but will not tip when subjected to wave action to the extent that oil from the slick may flow thereover. Stabilization of the panel structures when in a floating position is further attained by securing weights to the lower part of the portions thereof that are of accordianlike configuration.

3,645,100

LEACHING CHAMBER UNIT FOR SOIL ABSORPTION SYSTEM

Frank La Monica, Avon, Conn., assignor to A. Rotondo & Sons, Inc., Avon, Conn.

Filed Jan. 16, 1970, Ser. No. 3,358
Int. Cl. E02b 13/00
U.S. Cl. 61—13 9 Claims



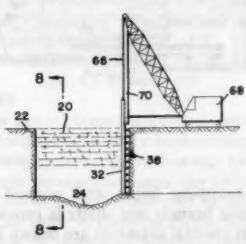
An effluent distributing leaching chamber unit adapted for arrangement with others in trench and field configurations to provide large area subsurface soil absorption systems. Each leaching chamber unit is a downwardly open rectangular precast concrete structure adapted to rest squarely on a prepared absorption bed and thereby enclose within its top, side, and end walls a volume of open space. Within the top wall there is formed an end to end extending flow conduit with complimentary shaped terminals in the end walls to permit flush serial end to end connection of units. The ceiling of the top wall is slotted at given intervals through to the flow conduit thereby to distribute and meter flow into each compartment. The side and end walls of a unit are also provided with rows of perforations above absorption bed level to allow air movement and, after row levels have been reached, fluid to pass out of and from one compartment to another.

3,645,101

METHOD AND APPARATUS FOR CONSTRUCTING IMPERVIOUS UNDERGROUND WALLS

James L. Sherard, 70 Hillcrest Road, Berkeley, Calif.

Continuation of application Ser. No. 739,805, June 25, 1968, now abandoned. This application Nov. 4, 1970, Ser. No. 86,979
Int. Cl. E02d 5/18
U.S. Cl. 61—35 32 Claims



A method for constructing an impervious underground wall by continuously enlarging an excavation by dislodging

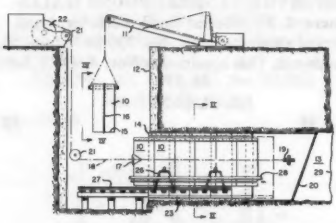
and fragmenting earth material to form a trench of long length and narrow width in the ground, adding a slurry to the excavation and mixing the fragmented earth material with the slurry in situ. The method comprises the steps of providing a movable but rigid barrier member within an initial slurry filled starter hole or trench so that fluid columns of the slurry are formed on the front and rear sides of the barrier; placing an earth-cutting tool in the front fluid column in contact with the face of the starter hole opposite the front side of the barrier member; manipulating the earth-cutting tool so as to remove progressively thin layers of material from the advancing face of the trench mixing the excavated material with the slurry of the front fluid column; adding additional fresh slurry; and causing the fluid mixture of slurry and cuttings to circulate to the rear column as the barrier-cutting tool continuously advances through the ground. The apparatus includes the barrier member which is operable to remain in a substantially vertical position, or at a constant inclination, as it moves along the trench being formed. Means are provided for preventing any substantial flow of fluid from the rear to the front column except below the bottom of the barrier. The cutting tool which may be directly connected to the movable barrier member is adapted to continuously remove relatively thin layers of earth material from the end face, which material is thoroughly mixed with slurry before it is circulated to the rear column where it gradually solidifies to form the impermeable wall. Other components of the apparatus include means to raise and lower and guide the upper end of the movable barrier member and manipulate the cutting tool, means to push the combined barrier-cutter tool forward against the advancing face of the excavation and means to add additional slurry. A wall constructed according to the method comprises a continuous narrow impermeable underground structure comprised of the solidified mixture of slurry and natural soil material having no joints, breaks, connections or overlaps. Depending on the character of the slurry used in the process the final product may be either a flexible and plastic wall of mixed soil and bentonite or a rigid and strong wall of soil-cement concrete.

3,645,102

TELESCOPING LINING AND SUPPORT STRUCTURE AND METHOD FOR LINING TUNNELS AND SHAFTS

Nicholas Chlumecky, Poland, Ohio, assignor to Commercial Shearing & Stamping Company

Filed Dec. 28, 1970, Ser. No. 101,875
Int. Cl. E01g *5/02*
U.S. Cl. 61—42 **4 Claims**



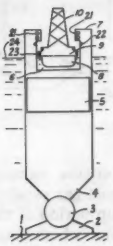
A novel telescoping lining and support structure and method for lining tunnels and shafts is provided in which a plurality of first chordal segments are drawn into a tunnel or shaft hole in a reduced diameter state of compression, expanded diametrically one after another in place in said tunnel or shaft and keyed in the expanded state by a second smaller chordal segment which completes an annular ring segment with the first chordal segment in place.

3,645,103

INDEPENDENT DRILLING RIG FOR ARTICULATED PLATFORM

Maurice Laffont, La Celle-St-Cloud, France, assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed June 15, 1970, Ser. No. 46,202
Claims priority, application France, June 18, 1969, 6920361
Int. Cl. E02b *17/00;* **B63b** *35/44*
U.S. Cl. 61—46.5 **2 Claims**



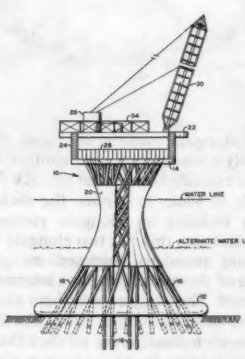
A marine drilling system consisting of an emergent articulated platform with positive buoyancy, fixed to a base by means of a coupling with two degrees of freedom, in which the said platform contains an opening of rectangular cross section extending from the top of the platform to a line situated several meters below the surface of the sea, the articulated platform being equipped with on the inside edges of the opening with hoisting gear, which is used for the positioning in the said opening of a drilling unit, transportable by a floating pontoon, which fits into the opening, by raising the drilling unit, which is locked on to the platform when in the correct position, it being possible for the drilling device forming part of the said unit to be moved in relation to the unit in the plane of the upper surface of the platform, so that drillings can be made from different points on the platform.

3,645,104

TOWER STRUCTURE

Roy E. Hogan, Berwick, La., assignor to Phillips Petroleum Company

Filed Dec. 29, 1969, Ser. No. 888,593
Int. Cl. E02b *17/00*
U.S. Cl. 61—46.5 **19 Claims**



A tower structure embodying the geometric properties of a hyperboloid of one sheet. Said tower comprises a lower base,

an upper platform, and a plurality of inclined legs extending between said base and said platform. Said inclined legs are so inclined and so spaced, with respect to a central axis, so that upon revolution of any one of said legs about said axis at an essentially constant angle of inclination there is described a surface of revolution which defines said hyperboloid.

3,645,105
INTERNAL TENSIONING SYSTEM FOR LAYING PIPELINE

Clyde E. Nolan, Jr., Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Apr. 15, 1970, Ser. No. 28,733
Int. Cl. F16l *1/00*; B23p *19/00*; B23q *3/14*
U.S. Cl. 61—72.3 **18 Claims**

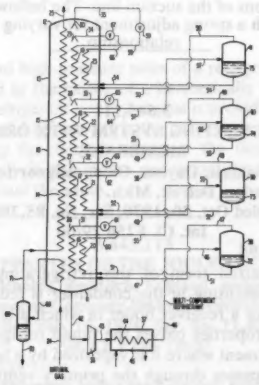
A method and apparatus for laying pipeline wherein the pipeline is externally clamped so as to be substantially fixed with respect to a floating vessel prior to connection of a new section of pipeline. After this connection, the pipeline is internally engaged by internal clamp means which is paid out with the pipeline being held under tension. Then the pipeline is again clamped externally and the internal clamp means is retrieved. A new section of pipeline is added and the payout operation is repeated.

The internal clamp means may be fluid operated and may be provided with means for engaging both the existing pipeline and the new joint. The portion of the internal clamp means engaging the new joint is mounted for rotation and translation with respect to the remaining portion of the internal clamp means to permit alignment of the pipeline and the new joint. Power transfers means is carried by a mandrel of the internal clamp means for use in actuating and moving the clamp means as well as for possible use with other equipment utilized internally of the pipeline.

3,645,106
PROCESS FOR LIQUEFYING NATURAL GAS EMPLOYING A MULTICOMPONENT REFRIGERANT FOR OBTAINING LOW TEMPERATURE COOLING

Lee S. Gaumer, Jr., and Charles L. Newton, both of c/o Air Products & Chemicals, Inc., P.O. Box 538, Allentown, Pa.

Continuation-in-part of application Ser. No. 882,781, Dec. 22, 1969, and a continuation-in-part of 3,571, Jan. 9, 1970, now abandoned. This application June 25, 1970, Ser. No. 49,622
Int. Cl. F25j *1/00*, *3/06*
U.S. Cl. 62—9 **8 Claims**

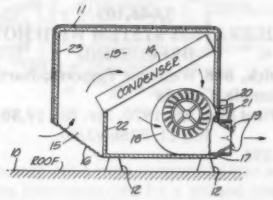


Refrigeration for liquefying natural gas is provided by a closed cycle refrigeration system employing a multicomponent refrigerant. A stream of multicomponent refrigerant flowing in the closed refrigeration system is compressed and then successively fractionated by partial condensation in a plurality of steps to provide condensates at progressively decreasing temperature levels. The condensates are separated and introduced under reduced pressure into a common zone in heat exchange with the natural gas and vaporization of the condensates. A stream of multicomponent refrigerant including the resulting vapor from the condensates is withdrawn from the zone for recycle. The multicomponent refrigerant includes a mixture of components consisting essentially of nitrogen and a plurality of hydrocarbons. In one presently preferred variant, the refrigerant is a mixture of nitrogen and more than three hydrocarbons having molecular weights between the molecular weight of methane and the molecular weight of hexane. Two of the hydrocarbons are methane and ethane. Ethane is the component of greatest percentage, methane is the component of second greatest percentage, and nitrogen is present in a percentage substantially less than that of methane.

3,645,107
AIR-COOLED CONDENSER ARRANGEMENT

Lester K. Quick, 868 Westview Crescent, North Vancouver, British Columbia, Canada

Filed Mar. 16, 1970, Ser. No. 19,739
Int. Cl. F25b *39/04*
U.S. Cl. 62—183 **13 Claims**



An air-cooled condenser arrangement for refrigeration systems to control the extremes of condensing temperatures wherein the condenser coil is mounted in the upper portion of an enclosed and insulated housing with the air inlet and outlet for the housing both positioned below the level of the condenser coil to inhibit undesirable air circulation through the condenser coil as a result of wind or the stack effect of heated air rising from the coil and a fan or blower at the outlet controls the air flow through the condenser.

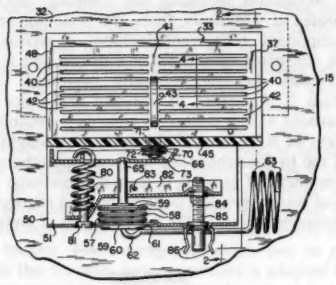
3,645,108
AIR DAMPER CONTROL FOR REFRIGERATORS

William J. Houk, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed June 1, 1970, Ser. No. 41,851
Int. Cl. F25d *17/04*
U.S. Cl. 62—187 **4 Claims**

A refrigerator has a frozen food compartment maintained at subfreezing temperatures and a food-cooling compartment maintained at temperatures above freezing by circulation of chilled air through the compartments, the air being chilled by passing it over an evaporator operated at subfreezing temperatures in an air duct. A thermostatically actuated damper regulates the flow of chilled air into and through the food-cooling compartment according to the temperature in the cooling compartment. The damper comprises two face-to-face grilles each having a multiplicity of slots alignable with

the slots of the other grille and one grille is shifted by a thermostatic element relative to the other to align more or less of the slotted areas. The thermostatic element is a vapor-filled bellows located in a housing in the chilling compartment and



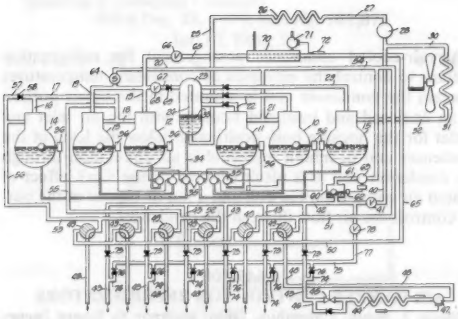
adjacent the air inlet. When the grilles are open air is aspirated from the compartment through the housing and in contact with the bellows and returned to the compartment with the chilled air.

3,645,109

REFRIGERATION SYSTEM WITH HOT GAS DEFROSTING

Lester K. Quick, 868 Westview Crescent, North Vancouver, British Columbia, Canada

Filed Mar. 16, 1970, Ser. No. 19,801
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 **26 Claims**



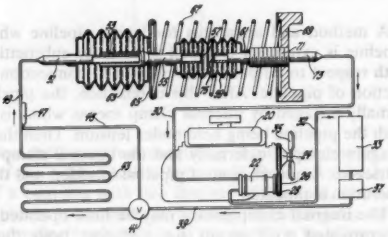
A refrigeration system particularly adapted for supermarkets and the like employing a multiplicity of refrigerated fixtures wherein centrally located compressors operate all the evaporators and each of the evaporators may be selectively defrosted with hot gaseous refrigerant from the high-pressure side of the system. In the various embodiments a chamber of reduced pressure is provided for receiving the defrosting refrigerant after passing through the evaporator and the chamber serves to separate the gaseous and liquid refrigerant with the liquid refrigerant being returned to the normal supply of liquid refrigerant for the evaporators and the gaseous refrigerant being returned to the compressor suction in a controlled manner. In the preferred and two alternate embodiments the pressure reduction is in the liquid supply line to the evaporators with the chamber also serving to separate flash gas caused by such pressure reduction as well as the returning gaseous defrosting refrigerant while in the other embodiment the pressure reduction in the chamber does not change the liquid supply line pressure to the evaporators.

3,645,110

TURBULENCE CONTROL

Leonard J. Mann, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 11, 1970, Ser. No. 36,191
Int. Cl. F25b *41/04*
U.S. Cl. 62—217 **2 Claims**



In the one preferred form, the exit and entrance ends of two portions of the suction conduit of an automobile air conditioning system are enclosed in a first flexible bellows. The portion connecting to the evaporator outlet is provided with a telescoping arrangement sealed within a second flexible bellows with the portion connecting to the evaporator being anchored. The other suction line portion is provided with a threaded adjustable spring support which supports one end of the coil spring extending to the spring retainer on the movable end of the second bellows. The expansion and contraction of the second bellows in response to the pressure applied by the telescoping connection moves the exit and entrance ends closer together or further apart to vary the turbulence of the flow between the exit and entrance to control the evaporating pressure and temperature within the evaporator.

In a second preferred form, a vane is moved by a bellows in response to either suction line or discharge line of pressure to increase the turbulence between the exit and entrance of the two portions of the suction line. The bellows may be provided with a spring adjustment for varying the pressure relationship.

3,645,111

REFRIGERATING SYSTEM WITH OSMOTIC MEMBRANE

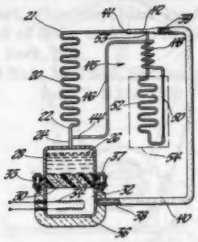
Victor A. Williamitis, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1970, Ser. No. 85,380
Int. Cl. F25b *29/00*
U.S. Cl. 62—498 **4 Claims**

In the preferred form of this refrigerating system, the refrigerant condensing in the condenser is fed to the upper compartment of a receiver boiler in which a membrane having osmotic properties passes the liquid refrigerant into the lower compartment where it is vaporized by a heater.

This vapor passes through the primary venturi passage of an aspirator which discharges into the top of the condenser. Some refrigerant liquefied in the condenser flows successive-

ly through one heat exchanger passage and a restrictor and



an evaporator and the second passage of the heat exchanger to the low-pressure suction inlet of the aspirator.

3,645,112

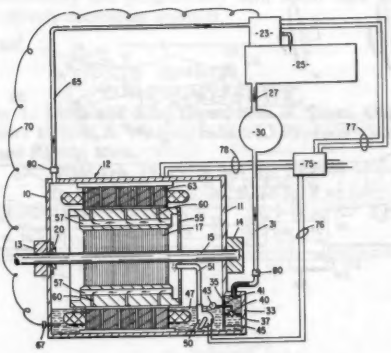
REFRIGERANT COOLING SYSTEM FOR ELECTRIC MOTOR

Gordon L. Mount, West Monroe, and James W. Endress, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed July 13, 1970, Ser. No. 54,137

Int. Cl. F25b *31/00*

U.S. Cl. 62—505 **2 Claims**



The low- and high-pressure sides of a refrigerant apparatus are connected to the casing of a hermetically enclosed electric motor. Refrigerant control means is provided to maintain a supply of liquid refrigerant in the casing at a predetermined level. A pump functions to dispense the liquid refrigerant from the supply in the motor casing on the components of the motor to cool the same.

3,645,113

COOLING APPARTUS OF THE JOULE THOMSON TYPE

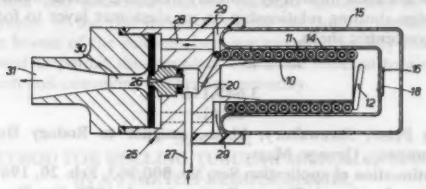
Kenneth E. Nicholds, Redditch, England, assignor to The Hymatic Engineerng Company limited, Redditch, England

Filed Feb. 16, 1970, Ser. No. 11,432

Int. Cl. F25b *19/00*

U.S. Cl. 62—514 **4 Claims**

In a Joule Thomson high-speed cooler, refrigerant from a supply in the form of gas under pressure flows through one path of a heat exchanger, and after expansion through a nozzle returns through the other path to a gas outlet, cooling the



incoming gas. In addition gaseous refrigerant is bypassed from the supply to an ejector serving to induce a suction at the gas outlet.

3,645,114

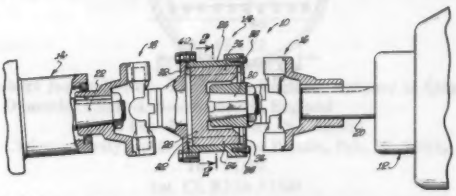
FLEXIBLE ROTARY DRIVE TRAIN HAVING SPLINED COUPLING WITH ELASTOMERIC CUSHIONS

Willard W. Shepherd, Whittier, Calif., assignor to Shepherd Machinery Co., Industry, Calif.

Filed May 8, 1970, Ser. No. 35,704

Int. Cl. F16d *3/64*

U.S. Cl. 64—14 **3 Claims**



A flexible rotary drive train comprising two axially spaced universal joints interconnected by a splined coupling having elastomeric cushions interposed between the internal and external splines on the outer and inner members of the coupling. The inner and outer members of the coupling are relatively moveable in the axial direction through a substantial distance to accommodate major variations in the length of the drive train in operation, while the elastomeric cushions serve to damp torsional vibration.

3,645,115

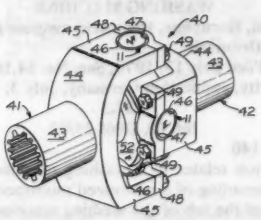
UNIVERSAL JOINT WITH LAMINATE BEARINGS

Daniel B. Shotwell, Washington, and Arthur J. Ritter, Metamora, both of Ill., assignors to Catermillar Tractor Co., Peoria, Ill.

Filed Oct. 5, 1970, Ser. No. 77,818

Int. Cl. F16d *3/28*

U.S. Cl. 64—17 A **13 Claims**



A universal joint employs a spider which is normally journaled with its input and output forks with the needle bearings

but according to this invention the needle bearings are replaced with laminated bearings formed of thin layers of metal and elastomer in which the cylindrical metal layers or shells are each formed by helically wrapping a metal band in an edge-abutting relationship on an elastomer layer to form the concentric shells.

3,645,116

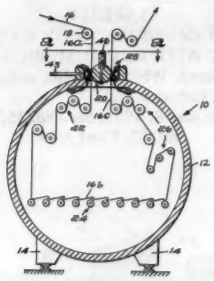
SEAL

Fritz Peter, Shrewsbury, Mass., assignor to Rodney Hunt Company, Orange, Mass.

Continuation of application Ser. No. 800,963, Feb. 20, 1969, now abandoned. This application Aug. 5, 1970, Ser. No. 61,455

Int. Cl. D06f *39/00;* **F26b** *25/00;* **B05c** *11/115*

U.S. Cl. 68—5 E **13 Claims**



A seal for an opening in a treatment chamber through which material continuously enters and/or exits from the chamber. The seal includes an endless inflatable element which is fixed relative to the chamber wall and which extends around the periphery of the opening, and an intermediate member suspended in the opening in a stationary position completely surrounded by the inflatable element. In a typical arrangement where one opening serves as both the entrance and exit for the material being processed, the material entering the chamber passes between the inflatable element and one side of the intermediate member, and the material exiting from the chamber passes between the inflatable element and the opposite side of the intermediate member. The inflatable element is inflated to an extent such that the space between the intermediate member and the periphery of the opening is effectively sealed, with the material entering and leaving the chamber being sealingly engaged between the inflatable element and the intermediate member.

3,645,117

WASHING MACHINE

Preben Larsen, Horuphav, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

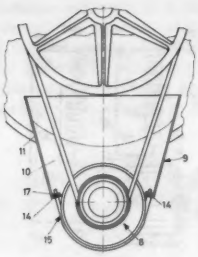
Filed July 13, 1970, Ser. No. 54,165

Claims priority, application Germany, July 3, 1969, P 19 33 827.3

Int. Cl. D06f *23/02*

U.S. Cl. 68—140 **1 Claim**

The invention relates to a washing machine and particularly to the mounting of a motorized multispeed gear unit on the end wall of the tub of the washing machine. The tub end wall is conically shaped to provide sturdiness and a mounting bracket is provided for attaching the gear unit to the tub end wall. The gear unit has an eccentrically disposed shaft and the mounting bracket has a saddle for holding the gear unit in selected positions so that the distance of the axis of the gear unit from the main shaft of the washer may be varied in



order to properly tension a drive unit to a pulley on the main shaft of the washer.

3,645,118

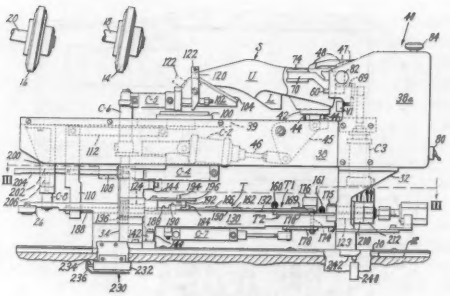
SHOE BOTTOM ROUGHING MACHINES

Edward S. Babson, Ipswich, Mass., assignor to USM Corporation, Flemington, N.J.

Filed Oct. 23, 1970, Ser. No. 83,487

Int. Cl. C14b *1/44*

U.S. Cl. 69—6.5 **8 Claims**



A machine for roughing the bottoms of shoes having a pair of roughing tools and a support for a shoe during relative movement between the tools and the support to cause the shoe to pass by the tools. A template assembly for positioning the tools in which the assembly includes cooperating forepart and heel portions automatically adjustable in lengthwise and widthwise directions to accommodate shoes of different sizes and is automatically reversed by rotation about its longitudinal axis, to accommodate right and left shoes in accordance with the size and character of the shoe on the support. The shoe support also embodies an abutment for determining the heightwise position of the toe end of each shoe placed thereon and a heel support including a selectively displaceable holddown means, the heel support being movable in response to the engagement of the heel end of a shoe therewith for actuating control means to initiate an automatic operating cycle of the machine.

3,645,119

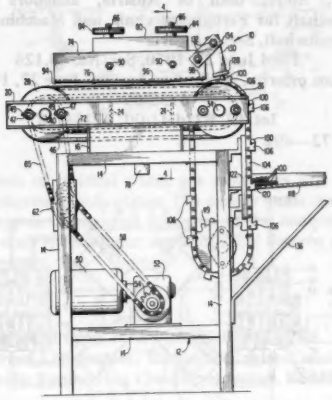
METHOD AND APPARATUS FOR STRAIGHTENING ELONGATED ARTICLES

Robert A. Berg; Robert W. Decker, both of Newcomerstown; Donald R. Hart, Guernsey, and David J. Weber, Newcomerstown, all of Ohio, assignors to Wallace-Murray Corporation, New York, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,354

Int. Cl. B21d *3/00*

U.S. Cl. 72—90 **7 Claims**



A method and apparatus for straightening an elongated article about all of the lateral axes thereof, wherein the article is continuously and progressively bent about such axes by progressively decreasing amounts.

3,645,120

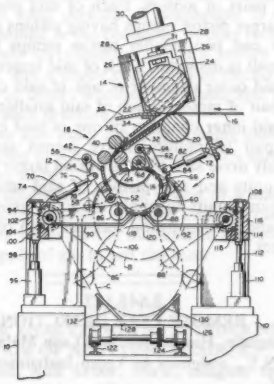
COILING APPARATUS

Arthur L. Lind, and John Gross, both of Salem, Ohio, assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Feb. 19, 1970, Ser. No. 12,597

Int. Cl. B21c *47/00*; **B21d** *5/14*

U.S. Cl. 72—134 **5 Claims**



Apparatus particularly suited for coiling heavy metal plate and comprising a bending roll assembly including three cooperating bending rolls positioned along the path of movement of the plate. The bending rolls are arranged to coil the plate in a downward direction as it passes therethrough. A coil receiving and supporting cage assembly is positioned beneath the bending rolls. The cage assembly includes a plurality of roll members extending parallel to the axis of the formed coil and mounted for outward movement as the diameter of the coil increases during the coiling operation. The lowest of the roll members are mounted so they can be moved to permit the complete coil to be lowered to a subjacent coil-conveying or carriage assembly.

3,645,121

METHOD FOR ROLLING TUBULAR MATERIAL STOCK IN A STRETCH REDUCING MILL

Gerd Pfeiffer; Horst Biller, both of Mulheim-Ruhr; Claus Schrey, Oberhausen, and Alfred Schmitz, Mulheim-Ruhr, all of Germany, assignors to Mannesmannrohren-Werke GmbH, Dusseldorf, Germany

Filed July 1, 1969, Ser. No. 838,384

Claims priority, application Germany, July 5, 1968, P 17 52 713.8

Int. Cl. B21b *17/00*

U.S. Cl. 72—205 **7 Claims**

A method for rolling down tubular material in a rolling mill wherein in the vicinity of the starting sections and/or end sections of the tubular material normally having thickened portions a stepwise variation of the rotational speeds is provided at the roll stands deforming these sections, said stepwise variation of said rotational speeds required for rolling the central section of the tubular material.

3,645,122

ROLLING MILLS

Robert James Harlow, Parkstone, England, assignor to Quay Dynamics Limited, Bournemouth, England

Filed Feb. 20, 1970, Ser. No. 12,951

Claims priority, application Great Britain, Feb. 25, 1969, 10,114/69

Int. Cl. B21b *31/00*

U.S. Cl. 72—237 **8 Claims**

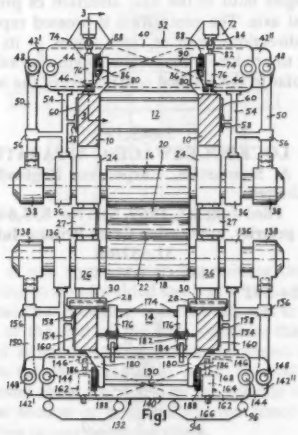


Fig1

Roll-deflection means for rolling mills are associated with outer and inner outboard bearings on roll extensions in that way that the outer outboard bearings are subjected to bending moments through levers and links by hydraulic units, while the inner outboard bearings act as fulcra, or vice versa.

3,645,123

PROCESS FOR MAKING METALLIC WIRES AND METALLIC WIRES PREPARED THEREBY

Andre Auge, 1. Avenue Edouard Droz, 25, Besancon, Doubs, France

Continuation-in-part of application Ser. No. 615,424, Feb. 13, 1967, now abandoned. This application Sept. 2, 1969, Ser. No. 857,291

Claims priority, application France, Feb. 18, 1969, 50133

Int. Cl. B21c *9/00*

U.S. Cl. 72—286 12 Claims

Small watch springs are manufactured from wire rod by means of a cold-drawing operation whereby the final cross-sectional, strip dimension is obtained without cold-rolling. The cold-drawing operation aligns and maintains the alignment of the crystallographic axes lengthwise along the strip and thereby optimizes the spring properties of the cold-drawn strip.

3,645,124

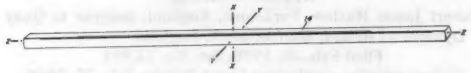
METHOD OF FORGING ELONGATED METAL SHAPES FROM INGOTS AND RESULTING PRODUCT

Roy E. Rohrabaugh, Youngstown, Ohio, assignor to Reactive Metals, Inc.

Filed June 25, 1970, Ser. No. 49,647

Int. Cl. B21j *1/04*

U.S. Cl. 72—377 5 Claims



A method of forging an elongated metal shape from an ingot. First the ingot is pressed in the direction of its central axis. Next the partially forged shape is pressed in a direction perpendicular to its central axis to elongate it in a direction at right angles both to the new direction of pressing and to the original axis. The piece then is pressed repeatedly in at least two directions both at right angles to its direction of elongation to produce a shape, the lengthwise axis of which is perpendicular to the original central axis of the ingot.

3,645,125

LOCKBOLT SWAGING APPARATUS

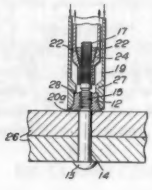
Frederick A. Summerlin, Harpenden, England, assignor to Avdel Limited

Filed June 23, 1969, Ser. No. 835,649

Claims priority, application Great Britain, July 2, 1968, 31,632/68

Int. Cl. B21d *9/05*

U.S. Cl. 72—391 3 Claims



The nosepiece of a tool for swaging the collars of swaged collar-type lock bolts has an anvil with a throat which is provided at its inner end with a radially inwardly projecting annular shoulder. This shoulder prevents a fully swaged collar entering completely into the throat. The annular shoulder also supports the axial thrust of the swaged collar on the nosepiece of the tool. The nosepiece can be used to place ordinary lock bolts in soft sheets which would not be strong enough to support the compression which would be developed between the swaged collar and the head of the lock bolt, when placed with a nosepiece not having the shoulder.

3,645,126

SWAGING MACHINE

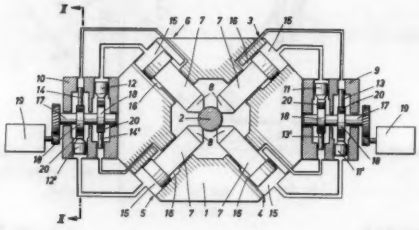
Bruno Kralowetz, St. Ulrich Bei Steyr, and Johann Braunwieser, Steyr, both of Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed June 22, 1970, Ser. No. 48,126

Claims priority, application Austria, June 27, 1969, A 6135/69

Int. Cl. B21d *41/00*; B21j *9/18*

U.S. Cl. 72—402 12 Claims



Means are provided which define a path of travel for a workpiece to be swaged through a machine housing. Four hydraulic cylinder-piston motors extend in said housing radially with respect to said path and are angularly spaced 90° apart around said path. Shaping tools are operatively connected to said cylinder-piston motors and operable to penetrate into a workpiece traveling along said path. Each of said cylinder-piston motors comprises a cylinder and a piston having a larger piston face remote from said path and a smaller piston face adjacent to said path. Each of said cylinders has an outer chamber defined by said larger piston face and an inner chamber defined by said smaller piston face. Said cylinder-piston motors are arranged to form two pairs of adjacent motors. Two pump units are provided, each of which is laterally secured to said housing and associated with one of said pairs of motors. Each of said pump units comprises two larger piston pumps having pistons relatively large in diameter and two smaller piston pumps having pistons relatively small in diameter. Each of said larger pumps is connected to said outer chamber of one of said cylinders of the associated pair of motors. Each of said smaller pumps is connected to said inner chamber of one of said cylinders of the associated pair of motors. Drive means are provided to synchronously drive said pistons of said larger pumps of both said pump units and said pistons of said smaller pumps of both said pump units to apply mutually assisting forces to said larger and smaller piston faces of each of said cylinder-piston motors.

3,645,127

REMOTE LEAK DETECTION

Guy E. Mongodin, Huntington, and Leon Malmed, Hicksville, both of N.Y., assignors to Veeco Instruments, Inc., Plainview, N.Y.

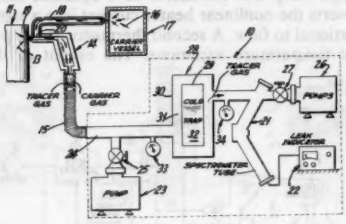
Filed Jan. 12, 1970, Ser. No. 2,102

Int. Cl. G01m *3/20*

U.S. Cl. 73—40.7 8 Claims

In a method and apparatus for remote detection of leaks in vessels wherein the vessel to be tested is pressurized with a tracer gas and a hand probe connected via a flexible conduit to a mass spectrometer apparatus is used to selectively sam-

ple the atmosphere near the surface of the vessel, a continuous flow of a condensable carrier gas of a different molecular weight than the tracer gas is injected into the vacuum system near the probe tracer inlet to increase capillary conductance and thereby cut down on response time as well as to sweep



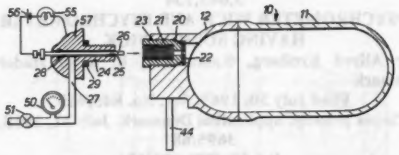
the line clean of residual tracer gas molecules and thereby prevent background indications. The carrier gas is condensed at a cold trap in the conduit upstream of the analytical portion of the mass spectrometer apparatus and thereby pumped out of the system.

3,645,128

CONTAINERS FOR PRESSURIZED GAS

Geoffrey Brian Longbottom, Redditch, England, assignor to The Hymatic Engineering Company Limited, Redditch, England

Filed Mar. 25, 1970, Ser. No. 22,457
Claims priority, application Great Britain, Mar. 26, 1969, 15,790/69
Int. Cl. G01m *3/34*
U.S. Cl. 73—49.3 **6 Claims**



A container pressurized gas capable of retaining the pressurized gas for long periods. A diaphragm is sealed in a socket in an opening in the container. A plug received by the socket has means for admitting gas at a known pressure to the diaphragm, and a probe connected in circuit with a battery and lamp to detect whether the diaphragm moves away from its under such pressure.

The container also has a charging opening closed by an interference fit plug in a narrow passage and a screw-threaded plug soldered in place.

It also has a discharge opening sealed by a diaphragm in a socket which communicates with the load and can receive an explosive igniter to pierce the diaphragm, or a connection to an auxiliary supply of gas to test the load.

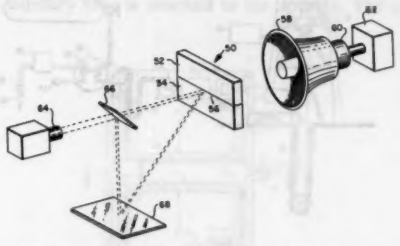
3,645,129

METHOD FOR ANALYZING THE JOINDER BETWEEN A PAIR OF ABUTTING MEMBERS

Ralph M. Grant, Ann Arbor, Mich., assignor to G. C. Optronics Inc., Ann Arbor, Mich.

Continuation-in-part of application Ser. No. 633,068, Apr. 24, 1967, now abandoned. This application Mar. 18, 1968, Ser. No. 745,054
Int. Cl. G01n *29/04*
U.S. Cl. 73—67 **8 Claims**

A transducer induces vibrations into a member including at least a pair of members joined to one another along a common surface. An exposed section of the two members, which may or may not include one line of their joinder, is illuminated with a source of coherent light while it is being vibrated and a photographic plate is exposed to both the reflected light and the direct coherent light. The plate is developed to provide a hologram which is then properly illu-



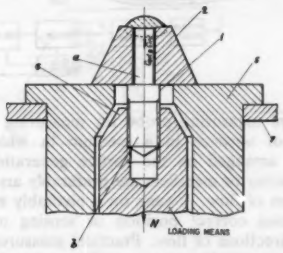
minated to recreate a visual image of the surface section. The visual image will contain fringe lines and/or shaded areas as a result of interference between light waves reflected from the member at the high and low points of its vibration. Anomalies in these lines and areas will reveal discontinuities in the joinder between the two members which affect the pattern of vibration of the surface section.

3,645,130

PROCESS TESTPIECE AND DEVICE FOR THE STATIC DETERMINATION OF THE MINIMUM DELAYED CRACKING STRESS OF WELDED STEELS

Adolf Million, str. Povernei 15-17; Carol Million, str. Belgsad 12, both of Bucharest, Romania, and Iosif Cabelka, str. Mudronova 52, Bratislava, Czechoslovakia

Filed Apr. 1, 1969, Ser. No. 843,872
Int. Cl. G01n *3/08*
U.S. Cl. 73—95 **4 Claims**



A method of and a system for determining the minimal delayed fissuring strain of welded steels in which a cylindrical steel rod is inserted through a hole in a support to a surface of the latter at the end of the hole opposite that through which the rod is inserted. The welding produces a heat-affected zone in the rod beneath the weld. The rod is loaded and placed under static traction with the specific road (load per unit cross section of the heat-affected zone) in which delayed fissuring occurs being the strain.

3,645,131

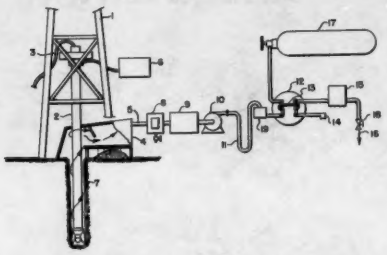
GAS DRILLING SOIL SAMPLING

James B. Turner, 4709 Tonawanda, and Harold L. Wise, 4522 Hummingbird, both of Houston, Tex.

Filed May 20, 1970, Ser. No. 39,677
Int. Cl. E21b *49/00*
U.S. Cl. 73—153 **9 Claims**

The concentration with location at which a mobile reservoir fluid is contained within subsurface earth formations is

measured by gas drilling a borehole into the earth formations while circulating a gaseous drilling fluid that is initially substantially free of the mobile reservoir fluid and measuring the



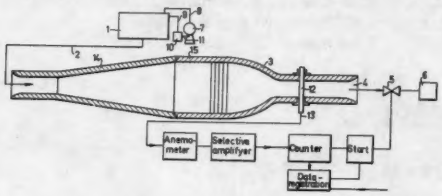
concentration of the reservoir fluid in the earth formations by measuring the difference in its concentration in equivalent portions of the drilling fluid that enters and leaves the borehole.

3,645,132

ELECTRICAL FLOW-MEASURING PROBE

Carl Georg Rasmussen, Ballerup, Denmark, assignor to Disa Elektronik A/S (Dansk Industri Syndikat A/S), Herlev, Denmark

Filed Sept. 3, 1969, Ser. No. 862,606
Claims priority, application Denmark, Sept. 23, 1968, 4569/68
Int. Cl. G01p *13/00*
U.S. Cl. 73—189 **14 Claims**



A hot-film measuring probe for measuring the shedding frequency of vortices in a medium in which a sensing member is arranged on the vortice generating body. The sensing member or members are preferably arranged to face the direction of flow. A vane on a pivotably mounted body may ascertain correct position of sensing members with changing directions of flow. Practical measurements can be carried out in the higher range of flow in which Reynolds number exceeds 300.

A measuring device with a measuring probe as described renders signals which can be converted in digital signals to be counted or stored.

A measuring device with a measuring probe comprising two sensing members increases the quality of the combined signal.

A measuring device with two probes renders a difference signal indicating the direction of flow.

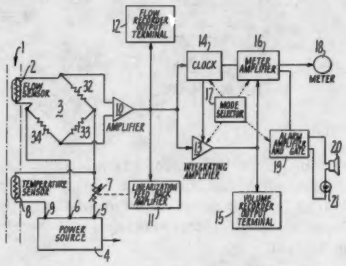
3,645,133

ELECTRONIC SPIROMETER

Peter G. Simeth, and Richard C. Seeley, both of Santa Barbara, Calif., assignors to Metrophysics, Inc.

Filed Apr. 15, 1970, Ser. No. 28,862
Int. Cl. G01f *1/00;* **G01p** *5/10*
U.S. Cl. 73—204 **2 Claims**

An electronic spirometer having an accurate indication of exhaled tidal or minute volume. In the preferred embodiment, an adapter fits on the exhalation port of the breathing circle and monitors a patient's exhaled volume when being ventilated. A heated thermistor mounted in the adapter senses the gas flow as an approximate fourth power function of the current necessary to maintain the thermistor at a constant temperature. A signal conditioner provides the current required to keep the thermistor at a constant temperature and converts the nonlinear heater current into a signal which is proportional to flow. A second thermistor in the probe corrects for temperature variations. The output of the signal



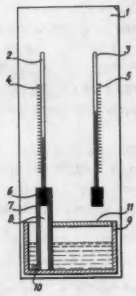
conditioner is fed into the integrator circuit which converts the flow signal to a volume signal. In the minute volume mode, a clock generates a command signal every 30 seconds. This transfers the integrator output into a readout unit and resets the integrator to zero. In the tidal volume mode, the flow is integrated on a breath by breath basis and the volume signal is read out when the exhaled flow reaches zero. Outputs are provided for recording the flow rate and the minute integrated volume. An alarm system is provided for indicating when minute volume limits are too low or too high.

3,645,134

PSYCHROMETER WICK AND PSYCHROMETER HAVING SUCH A WICK

Oskar Alfred Kreiberg, Kalkovnsvej 8, 6100 Hadersiev, Denmark

Filed July 30, 1969, Ser. No. 845,965
Claims priority, application Denmark, July 31, 1968, 3695/68
Int. Cl. G01n *25/62*
U.S. Cl. 73—338 **5 Claims**

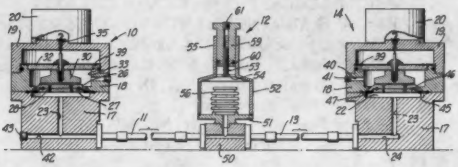


An improved psychrometer wick having a prolonged useful life, made possible by substantially filling the portion of a hose-shaped wick element intended to lie beneath the thermometer bulb with a body of suctorial material. The body of suctorial material may be in the form of a plug inserted into the hose-shaped wick element.

3,645,135
MERCURY SYSTEM

Benjamin H. Hadley, Claremont, Calif., assignor to Schwien Engineering, Inc., Pomona, Calif.

Filed Aug. 24, 1970, Ser. No. 66,224
Int. Cl. G01l 9/12
U.S. Cl. 73—398 C 14 Claims

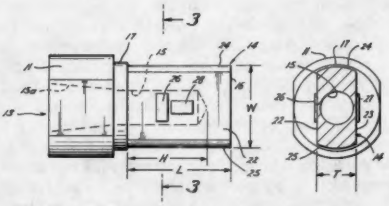


A mercury system for use as a level and as a manometer. A pair of cisterns with interconnected pools of mercury and with a float in each cistern serving as the lower plate of the cistern capacitor. A resilient sheet attached to the float and to the cistern for sealing the mercury in a lower chamber of the cistern. An alternative diaphragm consisting of a thin resilient sheet closing the mercury pool with the surface of the pool serving as a capacitor plate. A bellows unit connected in the mercury line between the cisterns for controlling the mercury level in the cisterns.

3,645,136
FLUID PRESSURE MEASURING DEVICE

Charles W. Calhoun, 1502 West 34th, Houston, Tex.

Filed Apr. 15, 1970, Ser. No. 28,802
Int. Cl. G01l 19/04, 9/04
U.S. Cl. 73—393 4 Claims



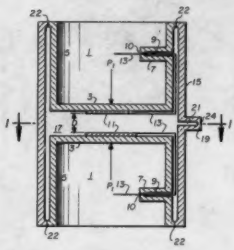
A metal piece is provided with a body portion having a center passageway extending from one end thereof to a point short of the opposite end thereof, such body portion having two flat parallel sides lying parallel to the center axis of the passageway. A pair of resistance strain gages are bonded to each of the two flat sides above the passageway. One strain gage on each flat side is oriented to measure transverse strain and the other is oriented to measure axial strain. The four strain gages are connected to form a Wheatstone bridge, the transverse strain gages causing the bridge to provide an indication of fluid pressure within the passageway and the axial strain gages providing temperature compensation for the bridge.

3,645,137
QUARTZ PRESSURE SENSOR

Edward J. Hazen, Woodcliff Lake, N.J., assignor to The Bendix Corporation

Filed Apr. 16, 1970, Ser. No. 29,222
Int. Cl. G01l 9/12
U.S. Cl. 73—398 C 14 Claims

A pair of identical quartz elements each having a end wall and a sidewall are disposed in an opening through an outer quartz member so that the end walls are opposed and spaced from each other. A portion of the sidewalls of each element are secured to the outer member to define an inner space between the elements and the outer member. Capacitor plates are formed on the opposed surfaces of the end walls to form a capacitor. Each plate has a conductor connected thereto which extends through a seal in the sidewall. The outer member has an opening extending to the inner space and a capillary tube is attached to the opening. The space

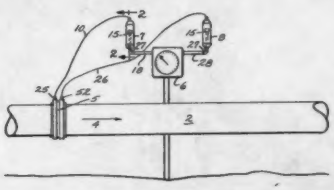


and a portion of the capillary tube are filled with a liquid having a known dielectric constant. A first pressure is applied to the opposing surfaces of the end walls through the capillary tube and a second pressure is applied to the other surface of each end wall so that the end walls flex in response to the pressures and the capacitance between the plates corresponds to the difference between the first and second pressures.

3,645,138
METER FOR MEASURING THE FLOW OF GAS

Calvin Raymond Fussell, Kermit, Tex., assignor to W. L. Jones, Jr., Odessa, Tex., a part interest

Filed July 9, 1969, Ser. No. 840,271
Int. Cl. G01l 7/18
U.S. Cl. 73—401 7 Claims



A mercury trap apparatus used in connection with a differential pressure meter comprising a plurality of mercury trap receptacles, each of the mercury trap receptacles having a pipe with a T-shaped nozzle inserted therein, and extending a predetermined distance into the enclosed area of the mercury trap receptacle; each of the mercury trap receptacles are connected to a gas pipeline by a high-pressure conduit and with the trap receptacle pipe being connected to a mercury differential pressure meter by a connector conduit.

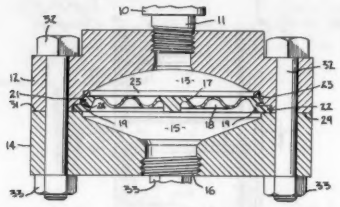
3,645,139
SELF-RETAINING DIAPHRAGM SEAL FOR RECORDING INSTRUMENT

John R. Zavoda, 429 State Route #303, Streetsboro, Ohio

Filed June 4, 1970, Ser. No. 43,372
Int. Cl. G01l 7/08
U.S. Cl. 73—406 4 Claims

A flexible diaphragm for a pressure recording instrument or the like which is provided with an annular groove around its periphery to define a resilient shoulder. The diaphragm is

mounted in a coupling member which communicates with the instrument and is snapped into detachable securement over a projection or shoulder of the coupling member, which fits into the annular groove. The groove may carry an O-ring or similar compressible seal to effect a sealing engagement between the seat of the groove and the inserted shoulder, or the O-ring seal may be compressed against the coupling member by some peripheral portion of the diaphragm, such

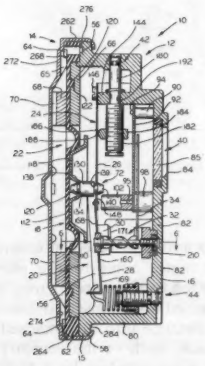


as a peripheral shoulder. Another sealing area may be provided by the abutment between the walls of the groove and the inserted shoulder of the coupling. Still another sealing area is provided by a marginal portion of the diaphragm which is compressed between the instrument coupling or flange member and another coupling or flange member is fastened thereto and which communicates with a process line.

3,645,140
PRESSURE GAUGE

James W. Phillips, Michigan City, and Richard S. Zoludow, South Bend, both of Ind., assignors to Dwyer Instruments, Inc.

Continuation-in-part of application Ser. No. 735,339, June 7, 1968, now Patent No. 3,566,060. This application June 15, 1970, Ser. No. 46,141
Int. Cl. G01l *7/08*
U.S. Cl. 73—407 R **16 Claims**

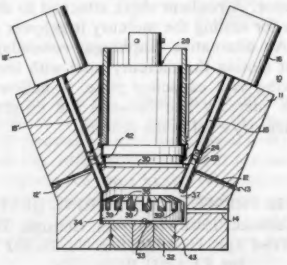


A pressure gauge in the form of two pressuretight compartments separated by a flexible diaphragm in which the gauge housing serves as the low-pressure chamber and a cover member secured to the housing over the diaphragm defines the high-pressure chamber. The gauge range spring is a leaf spring anchored to the housing at one of its ends with the other end of the spring carrying a permanent magnet that is disposed adjacent a rotatably mounted helix carrying an indicating arm which cooperates with the gauge scale. The leaf spring is connected to the diaphragm for movement by same, the spring rate of the leaf spring is adjustable externally of the housing by moving a shiftable fulcrum, and zero adjustment is provided including a threaded member actionable from outside the housing. The gauge is designed for low profile by placing both the high- and the low-pressure connections at the low-pressure side of the gauge, and providing for communication through the diaphragm to the high-pressure chamber.

3,645,141
RANDOM-ACCESS PRESSURE MULTIPLEXER VALVING ARRANGEMENT AND SYSTEM

Walter J. Moore, Suite 309, 4224 Saratoga Ave., Downers Grove, Ill.; Richard T. Cusick, 6108 Goodman Road, Laurel, Md., and Michael D. Byrne, Jr., Horizon House, Chase and Calvert Sts., Baltimore, Md.

Filed June 27, 1969, Ser. No. 837,161
Int. Cl. G01l *19/08*; F17d *3/00*
U.S. Cl. 73—420 **26 Claims**



The present invention relates to a unique multiple-sampling valve and system to provide a random-addressable time-division multiplex arrangement for pressure measurements which makes it more compatible with computer process control. A single pressure to electrical signal transducer forms one side of a common predetermined volume chamber and responds to pressure signals channeled to the chamber as a result of selective actuation from a plurality of sample ports wherein open connections may be established in random order or by predetermined sequence for measurements in the sample mode. A plurality of individual (energizeable linear solenoid) valve rods, disposed in proximity with the predetermined volume, minimizes the common volume and length of passageway between the valve rods and the transducer, substantially eliminating restrictions therebetween, thus decreasing the time required for the transducer to respond to one pressure signal from any given port. A second (and/or third) position of the valve rods serves to connect high-pressure fluid to all conduits sequentially (one at a time) for the diagnostic mode; and, simultaneously for the purging mode. Logical controls select the connections to be established, modes of operation, and analyze output conditions for locating any restrictions to determine sources of error.

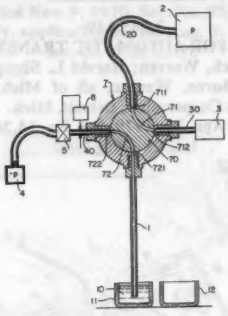
3,645,142
PIPETTE SYSTEM

Pierre Turpin, Burs S/Yvette, France, assignor to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Oct. 29, 1970, Ser. No. 85,056
Claims priority, application France, Nov. 3, 1969, 6937726
Int. Cl. G01n *1/14*
U.S. Cl. 73—425.6 **13 Claims**

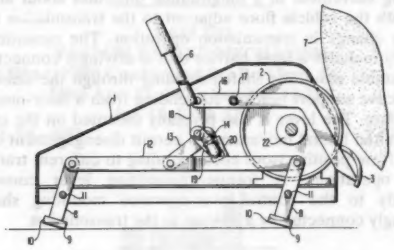
An apparatus for transferring a specific quantity of a liquid medium from one receptacle to another with precision. The

apparatus comprises a series of movable canals operatively disposed between the same container and the receptacle to which the same is to be transferred. In a preferred aspect, the



device is designed to transfer samples taken from human subjects, which samples are to be tested for diagnostically significant features.

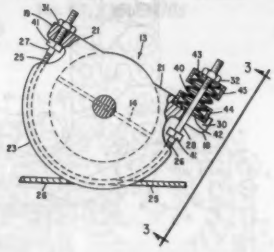
3,645,143
WHEEL SPINNER
Aubrey E. Greene, and F. F. Layfield, both of Ellaville, Ga.
Filed Sept. 25, 1970, Ser. No. 75,340
Int. Cl. F16h *37/00, 13/02*
U.S. Cl. 74—14 **5 Claims**



A wheel spinner for driving and braking the wheels of a vehicle for balancing the same or making measurements thereon comprising a frame with a spinning drum driven by a motor and a brakeshoe. A control lever is connected by linkages to the brake as well as to feet for mounting the spinner and has a forward position in which the brake is retracted and the spinner advanced on its pivoted feet by means of the linkages and a rear position, in which the spinner is rocked backward on its feet and the brakeshoe is advanced towards the vehicle wheel for braking. Between the two active positions, the control lever has a neutral position. The brake is operated with lost motion when the lever moves from neutral to the backward position.

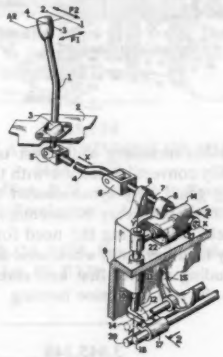
3,645,144
CABLE TENSIONING STRUCTURE FOR CENTRIFUGAL COMPRESSOR CONTROL
Kenneth C. Barrows, Jr., Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 22, 1970, Ser. No. 48,226
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.2 **2 Claims**

An arrangement to provide proper tension on the cable for operating the capacity control mechanism of a centrifugal compressor. One end of the cable is wrapped about a pulley member and fixed thereto. The opposite end of the cable is wrapped in opposite direction about the pulley member and has a threaded terminal piece extending through a lug formed on the pulley. A compression spring means is positioned on the extending portion of the terminal between the



lug and a nut threaded on the terminal. As the nut is threaded on the terminal, tension is applied to the cable. The arrangement includes means indicating the extent of the applied tension and to limit the tension to a maximum amount.

3,645,145
CONTROL DEVICE FOR A TRANSMISSION
Jacques Galas, Puteaux, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France
Filed Nov. 3, 1970, Ser. No. 86,492
Claims priority, application France, Dec. 26, 1969, 6945053
Int. Cl. G05g *9/18*
U.S. Cl. 74—473 R **8 Claims**

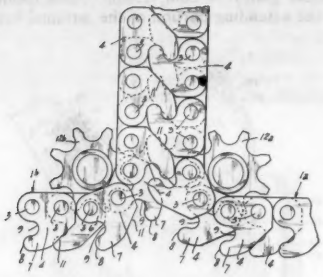


Transmission control device having two orthogonal shafts to one of which a gear lever is connected. The two shafts are interconnected by a system including a tube integral with one of the shafts. The tube has oblong-shaped end portions which are orthogonal to each other and respectively guide two rollers respectively placed in an end position and in an intermediate position on a rod integral with the other shaft, whereby a longitudinal movement and a rotational movement of the shaft connected to the gear lever produce respectively a rotational movement and a longitudinal movement of the other shaft.

3,645,146
INTERLOCKING CHAIN STRUCTURE
Tony Nagin, 14016 South Indiana Ave., Chicago, Ill.
Filed Sept. 29, 1969, Ser. No. 861,583
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.21 **11 Claims**

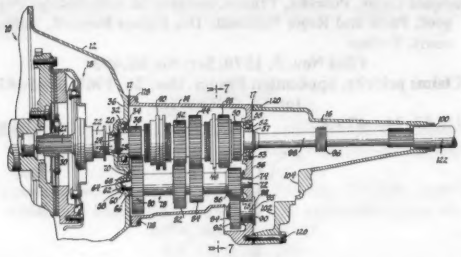
An interlocking rigid chain structure comprising a pair of roller-type chains having hooklike elements constructed to

interlock with one another as the chains pass between two sprockets to form a rigid assembly in which the chains of



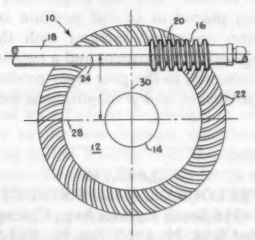
such assembly may be separated by movement of the latter in reverse direction between said sprockets.

3,645,147
TRANSMISSION
James W. Fodrea, 2783 Charter Blvd. Apt. 107, Troy, Mich.
Filed Nov. 10, 1969, Ser. No. 875,271
Int. Cl. F16h *3/08, 3/02*
U.S. Cl. 74—375 **12 Claims**



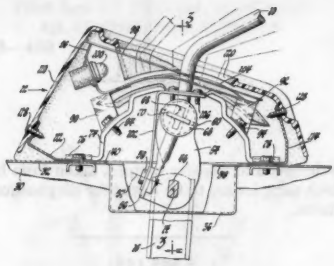
A transmission including a die cast transmission housing which is readily convertible for use with three-, four-, or five-speed, sliding gear, fully synchronized transmission assemblies, which assemblies may be accomplished on the motor vehicle, thereby eliminating the need for separate transmission assembly facilities, and, when used as a five-speed transmission, including a novel first and reverse duplex gear arrangement in the rear extension housing.

3,645,148
SKEW AXIS GEARING
Ernst Schrempp, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed June 15, 1970, Ser. No. 46,402
Int. Cl. F16h *1/14, 1/16, 1/20*
U.S. Cl. 74—423 **3 Claims**



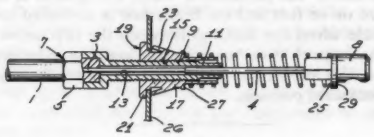
The disclosed skew axis gearing includes a face gear which is driven by a cylindrical pinion or worm gear having a constant lead throughout its axial length. The pinion teeth are of trapezoidal cross section and are symmetrical to a bisecting axis perpendicular to the pinion axis. Thus the pinion teeth have equal pressure angles.

3,645,149
CONTROL FOR AUTOMATIC TRANSMISSION
John D. Fitzpatrick, Warren; Harold L. Sharp, Farmington, and Bernard Burns, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 30, 1970, Ser. No. 33,262
Int. Cl. G05g *9/00*
U.S. Cl. 74—473 R **5 Claims**



Automatic transmission control in which the manual control level is supported by a mounting assembly for limited turning movement in a longitudinal direction about an axis beneath the vehicle floor adjacent to the transmission to effect a change in transmission operation. The mounting assembly includes a lever carrier that is drivingly connected to a rotatable mounting shaft extending through the sides of a protective support bracket suspending from a floor-mounted baseplate. The lever is also pivotally mounted on the carrier for limited lateral movement to permit disengagement of the lever from positive stops corresponding to different transmission operations. A torque-transmitting lever connected directly to the control-lever-operated mounting shaft is drivingly connected by a linkage to the transmission.

3,645,150
ADJUSTABLE CABLE ASSEMBLY
Francis D. Crossland, Ilford, England, assignor to Ford Motor Company, Dearborn, Mich.
Filed July 27, 1970, Ser. No. 58,510
Int. Cl. F16c *1/22*
U.S. Cl. 74—501 P **5 Claims**



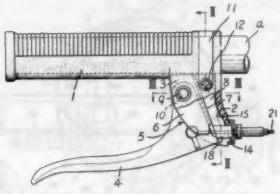
A motion transmitting cable assembly has a cap member mounted rotatably on one end of the cable sheath. The cap has an external threaded portion and the cable core member passes movably through the cap. A retaining plug having internal threads snaps into a stationary wall and receives the threaded portion of the cap member. Rotating the cap member relative to the retaining plug adjusts the position of the end of the core member.

3,645,151

HANDLEBAR GRIP FOR A TWO-WHEELED VEHICLE

Kunihiko Yoshikawa, Soka, Japan, assignor to Kabashiki Kaisha Yoshikawa Seisakusho, Tokyo, Japan

Filed Nov. 9, 1970, Ser. No. 87,911
Claims priority, application Japan, Aug. 8, 1970, 45/78519
Int. Cl. B62k *21/26*
U.S. Cl. 74—551.9 11 Claims



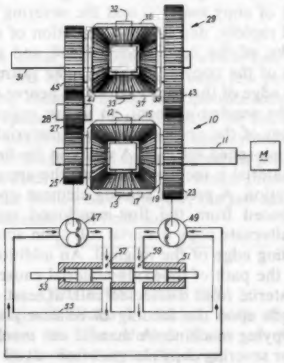
A handlebar grip comprises a cylindrical grip member adapted for being mounted on a vehicle handlebar and an attaching member integrally formed with the grip member of a plastic material. The attaching member has a groove in which a metal reinforcing member of channel shape is secured which receives the base of a pivotal operating lever. A pivot pin extends through the attaching member, reinforcing member and the base of the operating lever while a clamping band extends around the grip member and is attached thereto by a tightening fastener passing through the attaching member and the reinforcing member.

3,645,152

VARIABLE SPEED MECHANISM

Behzat Olcer, 1810 Cumberland St., Rockford, Ill.

Filed Apr. 27, 1970, Ser. No. 32,259
Int. Cl. F16h *37/06*
U.S. Cl. 74—682 7 Claims



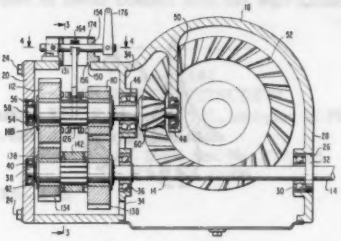
A controlled differential-gear system includes an input differential, an output differential, and an idler gear positioned between the two differentials to operate the output differential as a subtractive type when the input differential operates as an additive type. Brake means is arranged to brake one or the other side of the differentials to vary the output speed through an infinite range from maximum reverse, through zero, to maximum forward. Three arrangements of the differentials and two embodiments of the brake means are illustrated in the drawings.

3,645,153

DIFFERENTIAL DRIVE MECHANISM FOR VEHICLES

Ray V. Northcraft, 659 Cumberland Ave., Chambersburg, Pa.

Filed Apr. 7, 1970, Ser. No. 26,268
Int. Cl. F16h *37/08*
U.S. Cl. 74—700 13 Claims



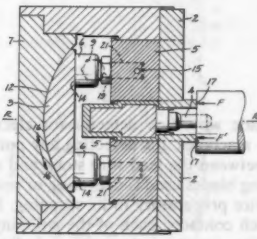
A differential gear drive mechanism for a vehicle employing an input drive shaft and a differential pinion shaft journaled for rotation about spaced parallel axes within a differential housing and meshing gears mounted on each shaft for connecting the two. The gear may quickly be replaced to change the drive ratio of the mechanism by removing a cover plate over an access opening in the housing adjacent one end of the two shafts. A selectively operable coupling device is provided to connect and disconnect one of the shafts from the gear train, and parallel gear trains may be employed between the two shafts with the coupling device being operable to connect one or the other gear trains alternatively to the associated shaft to permit the drive ratio to be changed without opening the differential housing.

3,645,154

CHUCK FOR LATHE, GRINDING OR MILLING MACHINE

Dennis J. Anderson, Ilion, N.Y., assignor to Remington Arms Company, Inc., Remington Arms Company, Inc., Bridgeport, Conn.

Filed Feb. 24, 1970, Ser. No. 13,535
Int. Cl. B23b *33/00*
U.S. Cl. 82—40 7 Claims



This invention relates to a mechanical chuck for a lathe, grinding machine, or milling machine which will automatically adjust the gripping jaws to provide equal support for the workpiece. The chuck is of the driving center variety, wherein the workpiece is centered and end-gripped. The chuck is designed to eliminate the disadvantages concomitant with hydraulic chucks, which tend to leak, jam, and need periodic servicing. A self-lubricating feature is also provided.

3,645,155

CUTTING AND/OR CREASING OF SHEET MATERIAL

Charles Robinson, Hawksley St., Industrial Estate off Manchester Road, Oldham, England

Filed Mar. 24, 1970, Ser. No. 22,234
Claims priority, application Great Britain, Mar. 26, 1969, 15,832/69
Int. Cl. B26d *1/32, 1/36;* B21k *5/12*
U.S. Cl. 83—663 12 Claims

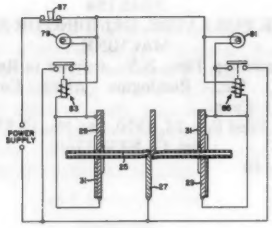
A forme member for a cutting and/or creasing machine comprise a rule and a base of ductile metal, the base engaging the marginal inner edge portions of the rule and at least partly filling notches or other openings in the rule.

3,645,156

AUTOMATIC WIRE NICK DETECTOR FOR ELECTRIC WIRE CUT AND STRIP MACHINES

Heinrich F. Meyer, Liverpool, and Edward L. Minchow, Syracuse, both of N.Y., assignors to General Electric Company

Filed June 11, 1970, Ser. No. 45,297
Int. Cl. H02g *1/12*
U.S. Cl. 83—9 3 Claims



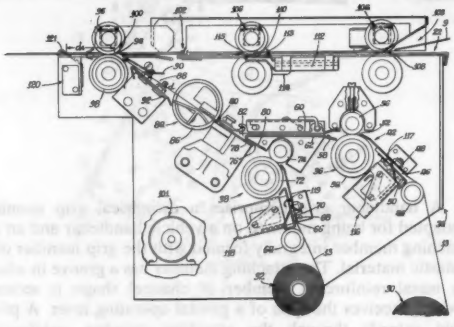
An automatic wire nick detector for electrical lead wire cut and strip machines, for detecting any potentially damaging contact between the lead wire stock and one of the insulation stripping blades used for severing or scoring the insulation of the wire preparatory to its stripping. For sensing and indicating such contacts, each of the stripping blades is connected in series circuit relation with an indicating or control device, with the wire cutter blades and, through those blades, with the length of wire stock which extends between them and the insulation stripping blades, so that in the event of any stripping blades contact with the wire the sensing circuit is completed and the indicating or control device is energized thereby. In this way reliable indication of nicking or other potential stripping blade damage to electrical leads as produced by wire cut and strip machines may be afforded automatically, with only very minor changes in the machine structure and very simple associated electrical circuitry.

3,645,157

ROLL FEED AND CUTTING APPARATUS FOR USE IN A PHOTOCOPY MACHINE

Albert J. Di Giulio, and Frank B. Naujokas, both of Arlington Heights, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Nov. 24, 1969, Ser. No. 879,487
Int. Cl. B26d *5/20*
U.S. Cl. 83—205 18 Claims



Apparatus is disclosed for feeding and cutting copy material from a roll in accordance with an original document fed into a multispeed, contact-type copying machine. The original and severed copy sheet are fed in synchronism into the machine by a pair of infeed rollers. A single sensing element positioned a predetermined distance upstream of the infeed rollers initiates the feeding of copy material from a selected roll upon being actuated by the leading edge of the original and causes the cessation of the feeding of copy material and the severing thereof, from the roll upon deactuation by the trailing edge of the original. The cessation of the feeding of copy material and the severing thereof is accomplished rapidly, due to the application of a high voltage to the brake of the copy material roll and to the cutting mechanism of the copying machine. The normal position of the leading edge of the copy material is nearer the infeed rollers than the sensing element, to insure registration of the leading edges of the original and copy material at the infeed rollers at high-speed settings. A delay in feeding and cutting the copy material is incorporated into the apparatus for low-speed operation. A second sensing element upstream of and laterally spaced from the first-mentioned sensing element selects an alternate copy material roll upon actuation thereof by the leading edge of the original. An additional, switching element in the path of the copy material causes the severing of copy material from a selected roll, at least of a predetermined length upon the feeding of relatively short originals into the copying machine. A manual cut mechanism is also provided for severing copy material from a roll when desired.

3,645,158

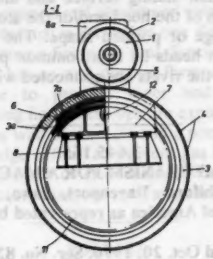
CIRCULAR CUTTER SHEARS FOR THICK PLATES

Karl Wilhelm Greis, St. Ingbert-Saar, Germany, assignor to Moeller & Neumann GmbH, Ingbert am Saar, Germany

Filed Dec. 2, 1969, Ser. No. 881,419
Claims priority, application Germany, Dec. 8, 1968, P 18 13 463.9
Int. Cl. B23d *19/04*
U.S. Cl. 83—492 5 Claims

In shears for trimming or slitting heavy plates and in which circular cutters cooperate to effect a cut, at least one of the

cutters is in the form of a ring which is internally supported on a stationary segment-shaped bearing. The cutters are

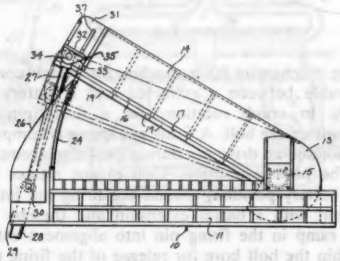


rotated by a drive which preferably engages the inner periphery of the cutter ring.

3,645,159
ALLIGATOR SHEARS

Julius L. Chazen, C/O SMC Industries, Inc., Chattanooga, Tenn.

Filed Jan. 28, 1970, Ser. No. 6,513
Int. Cl. B23d *17/06*
U.S. Cl. 83—599 **1 Claim**

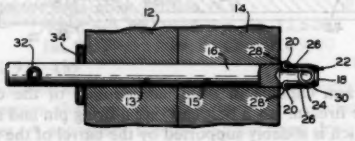


An alligator shear for large scrap which has a bed with widely spaced sets of anvil blades, a wide jaw pivoted to the bed and having shearing blades on opposite sides for coaction with the spaced sets of anvil blades on the bed to provide a double cut, fluid pressure operated cylinders arranged to pull down on the jaw, and spaced upwardly projecting protectors for the rods of the cylinders, which protectors serve as guides for the front end of the jaw, the jaw and bed being exposed and accessible on both sides.

3,645,160
QUICK RELEASE PIN

Louis J. Artioli, and Giulio V. Savioli, both of Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 7, 1969, Ser. No. 864,440
Int. Cl. F16b *19/00*
U.S. Cl. 85—5 R **1 Claim**

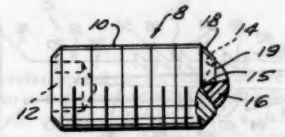


The joining of adjacent parts can be quickly and releasably accomplished by an elongated pin containing a unitary torsion member therein provided with flexible arms terminating in looped ends arranged to protrude from the opposite sides of the pin and prevent the withdrawal thereof from the adjacent parts until the pin is pulled with sufficient force to cam the looped ends back into the interior thereof. The torsion member provides a prestress action through the coil portion thereof engaging the walls of a cylindrical recess in the pin and outwardly diverging straight arms extending from the coil portion in linear contact with the wall surfaces of the recess.

3,645,161
SOLDER TIP SETSCREW

Lew Wesker, East Rockaway, N.Y., assignor to PIC Design Corp., East Rockaway, N.Y.

Filed Nov. 18, 1969, Ser. No. 877,695
Int. Cl. F16b *35/00*
U.S. Cl. 85—1 SS **5 Claims**

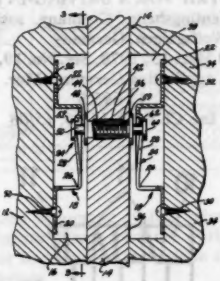


A setscrew comprising a rounded soft metal tip extending from a threaded shaft. The soft metal tip is adapted to contact a member against which it is forced without damaging deformation to the member or the tip. The setscrew is constructed by melting a piece of soft metal on to a recessed portion in the end of the threaded shaft.

3,645,162
COUPLING MEMBER

Philip C. Welch, Grand Rapids, Mich., assignor to Modular Systems, Inc., Fruitport, Mich.

Filed Mar. 6, 1970, Ser. No. 17,241
Int. Cl. F16b *5/07, 35/04*
U.S. Cl. 85—4 **10 Claims**



This disclosure relates to a coupling member for securing the butt ends of two panels to a central panel, and to the joint structure formed therewith. The coupling member is formed from first and second elongated members, the first elongated member having a tubular portion with internal and external threads, and an opposite end having a radial shoulder to abut the sides of a panel and an expanded head

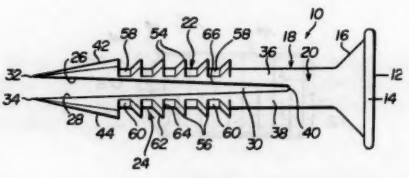
spaced therefrom. The second elongated member forming the coupling member has at one end a threaded stud to be received within the first elongated member tubular portion and at the other end a radial shoulder and an expanded head spaced therefrom. In the joint formed with the coupling member, the expanded heads engage flexible and resilient clips having slots to receive the ends of the coupling members and the clips are fixed within recesses in butt ends of two panels. The joints thus formed are flexible and hidden from view.

3,645,163

EXPANDING NAIL

Henry L. Byland, Lighthouse Point, Fla., assignor to Futuristic Building Products Inc., Northbrook, Ill.

Filed Oct. 14, 1969, Ser. No. 866,190
Int. Cl. F16b *15/04*
U.S. Cl. 85—13 **6 Claims**



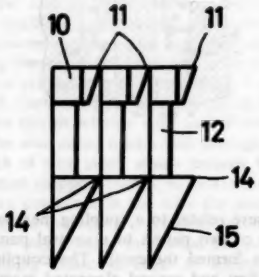
An expanding nail which is split longitudinally from the tip end thereof to form two shank halves which squeeze together when the nail is driven through a member and expand to anchor the nail to the member. In a preferred embodiment, the shank halves have inner faces which slant inwardly from the tip end to bases of the shank halves to provide sufficient thickness of material in the shank at the bases of the shank halves to withstand flexure. The tips of the shank halves have outwardly slanting surfaces which act to squeeze the tip together when the nail is driven, and the shank halves have barbs spaced along the length thereof to receive material between the barbs so that the barbs catch on the material and hold the nail firmly in place. The nail is particularly suitable for attaching wallboard such as gypsum board to metal studs in building construction.

3,645,164

RIVET STRIP FOR A DRIVING-IN DEVICE

Horst Wurth, Heutingsheim, Germany, assignor to Walter Schnabel, Im Wolfsgalgen, Germany

Filed Mar. 13, 1970, Ser. No. 19,453
Claims priority, application Germany, Mar. 13, 1969, P 19 12 695.5
Int. Cl. F16b *15/06, 15/08*
U.S. Cl. 85—17 **6 Claims**



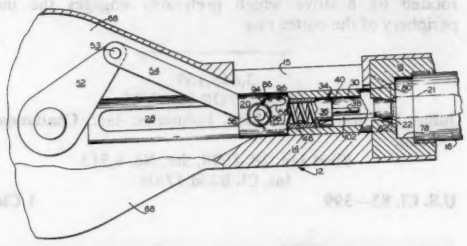
A rivet strip for driving-in or stapling device in which one-piece rivets provided with a head, a shaft and a stop element in the tip of the shaft having a shoulder facing the head. The individual rivets have their attachment side formed as planar sliding surfaces extending over the head shaft and stop elements. The individual rivets have one attachment side formed as a planar sliding surface and another attachment side in the region of the head and/or the stop elements which extend in an edge or pointed shape. The upper surface of each of the rivet heads lie in a common plane whereby the edge or point of the rivets are connected with the sliding surface of the strip.

3,645,165

FIRING MECHANISM FOR A MACHINEGUN

William P. Wohlford, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 20, 1970, Ser. No. 82,278
Int. Cl. F41d *7/02*
U.S. Cl. 89—11 **5 Claims**



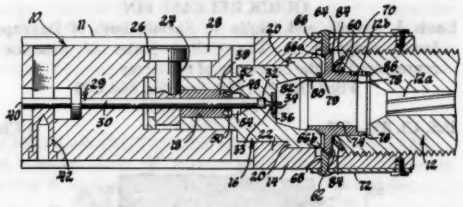
A firing mechanism for a machinegun which comprises a bolt movable between a retracted and a battery position responsive to crank rotation and a firing pin slidingly disposed within the bolt. A firing pin spring is compressed by the crank-actuated drive pin during final displacement of the bolt to the battery position. Cam means rotates the bolt, when in battery position, around the firing pin into locked engagement with a barrel extension and thereby moves a recessed ramp in the firing pin into alignment with a sear fixed within the bolt bore for release of the firing pin when the locking engagement is completed.

3,645,166

OBTURATOR FOR CASELESS AMMUNITION FIREARM

Roy D. Plumer, Santa Barbara, and Donald J. Irby, Goleta, both of Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed July 28, 1969, Ser. No. 845,284
Int. Cl. F41d *11/00, 11/16*
U.S. Cl. 89—26 **3 Claims**



A firearm capable of firing ammunition of the caseless-type The firearm has a bolt carrying a firing pin and an obturator which is slidably supported by the barrel of the firearm. The obturator is provided with a radial extending wall and the pressure of the gas within the chamber, when a round of caseless ammunition is fired, forces the obturator into tight

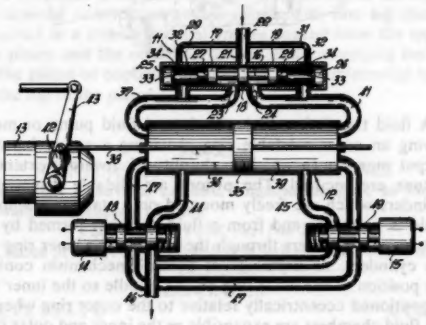
engagement with the bolt to prevent gas leakage. The obturator also has a circumferentially extending wall of relatively thin radial dimension which is forced against the barrel when the round of caseless ammunition is fired. A ratchet-and-pawl arrangement is provided connected with the obturator and as the bolt is opened and closed and rotated during these operations the obturator is rotated in one direction. The bolt has a bore containing a firing pin seal disposed about the firing pin. This seal has an end portion formed with an axially extending groove to provide inner and outer circumferentially extending lips. These lips are expanded respectively against the bore wall of the bolt and a portion of the firing pin when a cartridge is fired to prevent gas leakage. The firing pin includes a shaft of steel material having a firing tip formed of a refractory material such as a tantalum alloy.

3,645,167

CONTROL ARRANGEMENT FOR HYDRAULIC MOTORS

Helmut Espenschied, Buhlertal, and Joseph Sauer, Schwieberdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 19, 1969, Ser. No. 886,623
Claims priority, application Germany, Dec. 20, 1968, P 18 15 915.4
Int. Cl. F15b *13/043, 9/09*
U.S. Cl. 91—31 **10 Claims**



A hydraulic control arrangement for controlling the operation of a hydraulic motor equipped with a piston which may be subjected on both sides with fluid pressure. A control valve controls the flow of fluid under pressure from the motor to the return flow duct. A directional valve communicates with both sides of the piston of the motor and is actuated by the fluid flow. The control slide of the directional valve is urged, through spring action, into a neutral inoperative position, in which a fluid inflow duct to the directional valve is closed. The control slide connects two ports leading to hydraulically operated devices, with the inflow duct, when in operating positions. Flow chambers at both ends of the control slide communicate with the ports and the inflow duct through throttling passages.

3,645,168

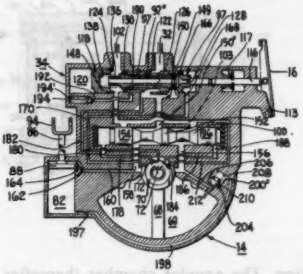
FLUID MOTOR

Anthony R. D'Alba, Williamsville, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,626
Int. Cl. F01l *33/00, 25/06;* **F01c** *9/00*
U.S. Cl. 91—189 **10 Claims**

A hydraulic motor includes a primary drive piston for driving a motor shaft which oscillated within a main housing chamber. A secondary linearly reciprocating drive piston is disposed within an auxiliary housing chamber for driving a secondary drive shaft. A shuttle-type reversal valve and conduits route pressurized fluid alternately to and from opposite sides of the primary piston to cause oscillation during running of the motor and to park it in a position beyond its running range.

The controller valve and conduits also route pressurized fluid to and from opposite sides of the secondary piston through sequence valving to effect reciprocation thereof. The sequence valving is actuated when the primary piston is oscil-



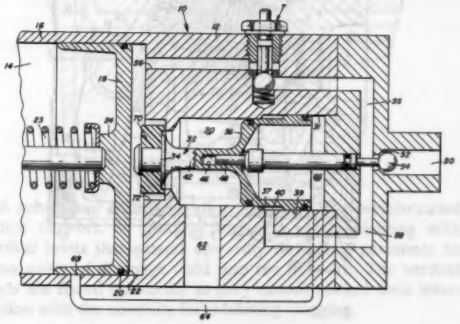
lated and preferably only at the time when the primary piston is moving to or from its park position. Thus the primary drive shaft can run continuously to operate a pair of windshield wipers, for example, while the secondary drive shaft can run only when the wipers move to and from a concealed parking position beyond the normal running range to operate a cowl panel, for example, which conceals the wipers in a parked position and opens to permit operation of the wipers.

3,645,169

CYCLING VALVE

Raymond Clark, Pewaukee, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Mar. 24, 1970, Ser. No. 22,150
Int. Cl. F01l *15/16, 25/06*
U.S. Cl. 91—268 **2 Claims**



A pilot-operated pneumatic cycling valve having means to isolate the pneumatic forces from the working elements of a pneumatic motor to permit an increase in cycling speeds and a horsepower savings.

3,645,170

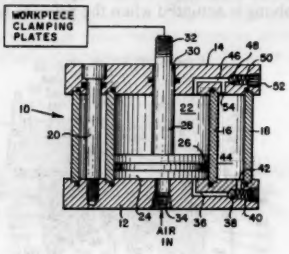
AIR CYLINDER WITH SELF-CONTAINED PNEUMATIC PISTON RETURN

Theodore A. Varouxis, 5375 Duke St., Alexandria, Va.

Filed Aug. 1, 1969, Ser. No. 846,859
Int. Cl. F15b *15/22, 15/17*
U.S. Cl. 91—399 **1 Claim**

An air cylinder having an annular chamber disposed around the piston chamber, a portion of the pressure fluid

causing the working stroke of the piston is passed to and accumulated in the annular chamber during the working stroke



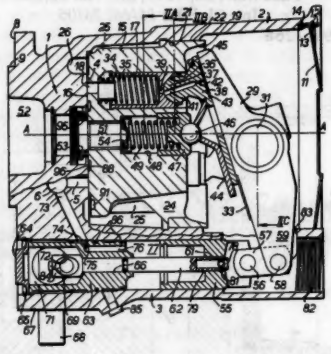
of the piston. The annular chamber thereafter supplies the accumulated pressure fluid to one end of the piston chamber to actuate the return stroke of the piston.

3,645,171

SWASH PLATE DEVICE

Donald Patterson McLeod, Cheltenham, England, assignor to Dowty Technical Developments Limited

Filed May 1, 1970, Ser. No. 33,715
Claims priority, application Great Britain, Mar. 14, 1970, 12,356/70
Int. Cl. F04b 1/02
U.S. Cl. 91—487 **6 Claims**



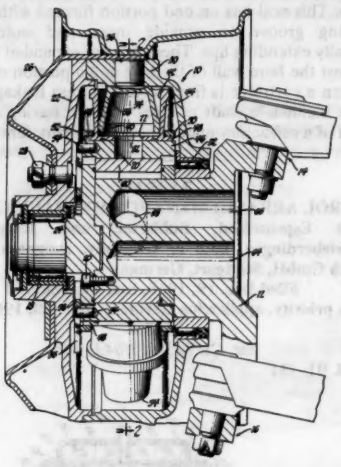
A swashplate pump or motor in which the drive shaft is arranged to extend from the cylinder block through an aperture in the valve on which the cylinder block rotates, the aperture being open outwardly to the atmosphere. A circular seal is provided in the valve means to engage a flat surface at the end of the cylinder block whereby to form a seal against escape of liquid from the valve into the aperture. A circular groove is formed in the valve or the cylinder block in between the seal and the ports in the valve means and is connected to the low-pressure port whereby liquid at low pressure in the low-pressure port provides a low-pressure zone within the groove to prevent centrifuging of air from the aperture over the surface of the seal and into the swashplate pump or motor.

3,645,172

VARIABLE DISPLACEMENT FLUID PUMP MOTOR

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 4, 1970, Ser. No. 43,334
Int. Cl. F01b 13/04
U.S. Cl. 91—497 **3 Claims**



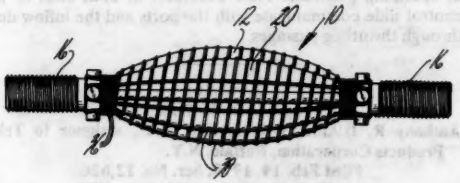
A fluid translating device such as a fluid pump or motor having an outer rotatable ring providing a power input or output member to which a plurality of inwardly extending pistons are secured. The pistons are slidably disposed in cylinders which are freely mounted on a stationary spindle. Fluid is ported to and from a fluid chamber formed by the pistons and cylinders through the spindle, the inner ring and the cylinders. A displacement control mechanism controls the position of the inner ring on the spindle so the inner ring is positioned eccentrically relative to the outer ring whereby the fluid chambers are expansible as the inner and outer rings rotate. The outer ring may be secured to a mechanical member which provides an output drive such as a vehicle wheel or may be driven by a mechanical input such as a motor.

3,645,173

FLUID ACTUATOR

John M. Yarlott, Harvard, Mass., assignor to Trish Energetics, Inc., Harvard, Mass.

Filed Oct. 20, 1969, Ser. No. 867,463
Int. Cl. F01b 19/00
U.S. Cl. 92—92 **15 Claims**



A fluid actuator comprising an axially elongated flexible thin-walled shell defining a fluid chamber and having coupling members projecting axially outwardly from opposite ends thereof for attachment to other elements in a system to be actuated. The shell is adapted for radial expansion and contraction in response to variation of fluid pressure in the

chamber to move the coupling members between axially retracted and extended positions and has a generally prolate spheroidal form in its radially expanded condition. A network of substantially nonelastic or inextensible strands embedded in the elastomeric material from which the shell is made prevents elastic expansion of the shell wall within the range of normal fluid operating pressure.

3,645,174

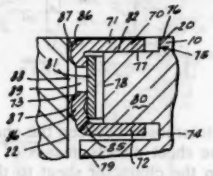
ANTIEMISSIONS COMPRESSION PISTON RING

Herbert F. Prasse, Town and Country, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Original application Apr. 14, 1969, Ser. No. 815,653. Divided and this application Nov. 10, 1970, Ser. No. 88,344

Int. Cl. F16j *1/00, 9/06, 9/20*

U.S. Cl. 92—193 **7 Claims**



A U-shaped cross section piston ring for use at the top of an internal combustion engine piston with one leg thereof received in a circumferential groove spaced from the top of the piston and the other leg thereof either overlying the top of the piston or coplanar therewith in a circumferential ledge at the top of the piston.

3,645,175

CONTINUOUS ROD MAKING MACHINES

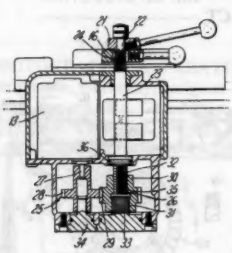
Jan Antoni Rakowicz, London, England, assignor to Molins Machine Company Limited

Filed Apr. 7, 1970, Ser. No. 26,316

Claims priority, application Great Britain, Apr. 10, 1969, 18,393/69

Int. Cl. B31d

U.S. Cl. 93—1 C **6 Claims**



A cigarette filter rod making machine has a diameter control comprising a platen which moves up and down in response to signals from a diameter-sensing device. The platen is positioned by a servomotor which preferably controls the platen via a gear train and a differential screw drive.

3,645,176

SEALING MEMBER

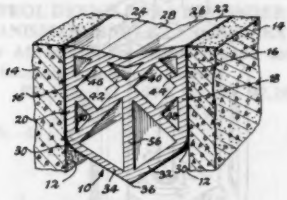
William J. Berchou, Buffalo, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Sept. 10, 1969, Ser. No. 856,735

Int. Cl. E01c *11/10*

U.S. Cl. 94—18 **6 Claims**

An elongated resilient sealing member for use in an expansion joint comprising a top wall, a bottom wall and opposite sidewalls forming a tubular structure. The interior of the tubular structure is provided with a truss construction including a pair of intersecting crossbars extending from the top wall downwardly at an angle to either the intersections of the bottom wall with the sidewalls or to the bottom wall at points below such intersections. A pair of short bars extend



downwardly at an angle, from the opposite sidewalls to the intersecting crossbars. These short bars in conjunction with the intersecting crossbars urge the bottom wall portions of the sealing member against adjoining support surfaces during compression to increase the interfacial surface contact area of the sealing member with such support surfaces.

3,645,177

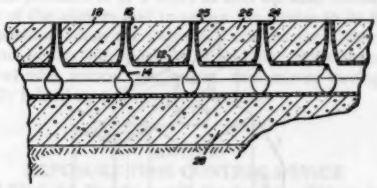
PAVEMENT DRAINAGE SYSTEM

Emil R. Hargett, 3801 Kelli Lane, Bryan, Tex.

Filed Mar. 24, 1970, Ser. No. 22,256

Int. Cl. E01c *11/24*

U.S. Cl. 94—33 **2 Claims**



A subsurface drainage system consisting of a prefabricated lattice network of conduits mutually communicating with vertical inlets that extend upwardly through a pavement to allow entry of drainage fluid into the network. The vertical inlets are flared outwardly as they extend toward their intersection with the conduits for inhibiting clogging.

3,645,178

APPARATUS FOR EXPOSING PHOTORESIST IN CYLINDERS

Charles G. Speicher, Apalachin, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

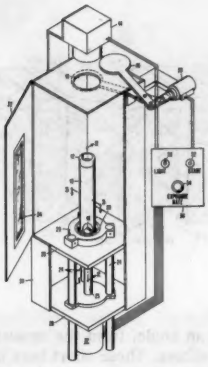
Filed Mar. 27, 1969, Ser. No. 811,151

Int. Cl. G03b *37/00*

U.S. Cl. 95—1 **9 Claims**

A photoresist coating on a cylinder is exposed by placing a mask loosely inside the cylinder and then shining a nondivergent beam of light down the center of the cylinder and onto a conical mirror. The conical mirror reflects the light radially outward through the mask to expose the photoresist on the inner surface of the cylinder. Photoresist on the outside of

the cylinder may also be exposed in the same manner by placing a conical mirror around the periphery of the cylinder.



To expose the entire length of the cylinder, the conical mirror is moved gradually along the length of the cylinder.

3,645,179

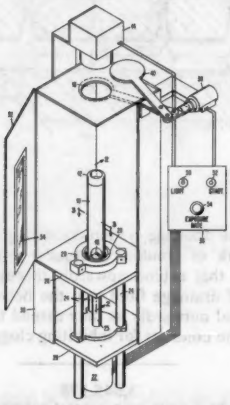
APPARATUS FOR EXPOSING PHOTORESIST IN CYLINDERS

Kenneth N. Karol, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1969, Ser. No. 811,023

Int. Cl. G03 *B37/00*

U.S. Cl. 95—1 **8 Claims**



A photoresist coating on a cylinder is exposed by placing a mask loosely inside the cylinder and then shining collimated light down the center of the cylinder and onto a conical mirror. The conical mirror reflects the light radially outward through the mask to expose the photoresist on the inner surface of the cylinder. Photoresist on the outside of the cylinder may also be exposed in the same manner by placing a conical mirror around the periphery of the cylinder. To expose the entire length of the cylinder, the conical mirror is moved gradually along the length of the cylinder.

3,645,180

PHOTOGRAPHIC PRINTING APPARATUS

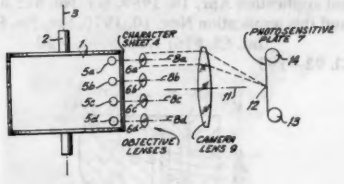
Tohru Nakajima; Susumu Tashiro, both of Tokyo; Kenmi Tsukatani, Mitaka-shi, and Koichi Mori, Tokyo, all of Japan, assignors to Asahi Optical Company, Ltd., Tokyo and Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1968, Ser. No. 787,507

Claims priority, application Japan, Dec. 28, 1967, 43/85044; 42/85045

Int. Cl. B41b *17/10*

U.S. Cl. 95—4.5 **3 Claims**



A lens system interposed between the character sheet and the photosensitive sheet directs images of selected ones of the characters on the character sheet to the photosensitive sheet. The lens system comprises a plurality of objective lenses and a camera lens having optical axes parallel to each other and perpendicular to the character sheet. The objective lenses have focal points on the character sheet and the camera lens has a focal point on the photosensitive sheet and intercepts all parallel light quanta transmitted by the objective lenses.

3,645,181

CAMERA WITH AUTOMATIC EXPOSURE TIME DETERMINATION

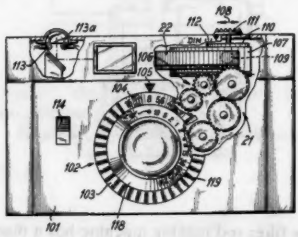
Wilhelm Reiche, Braunschweig, and Dieter Mehlitz, Stuttgart-Mohringen both of Germany, assignors to Voigtlander A.G., Braunschweig, Germany

Filed July 22, 1969, Ser. No. 843,426

Claims priority, application Germany, July 25, 1968, P 17 72 949.6

Int. Cl. G03b *37/00*

U.S. Cl. 95—10 CT **3 Claims**



A camera which enables the operator to select an exposure aperture while providing automatically an exposure time influenced at least in part by the selected aperture. An indicating element, such as a lamp, indicates when a given exposure time is reached. A scale of exposure times is available to the operator to be moved with respect to a scale of apertures so as to situate in line with the selected aperture that exposure time of the exposure time scale which corresponds to the given exposure time when the indicating lamp becomes illuminated. This will locate in line with the several apertures of the aperture scale several exposure times which form with these apertures different pairs of exposure times and apertures which may be selectively used instead of the previously selected aperture and the given exposure time which cor

responds thereto. Thus, even though the operator is normally unaware of the particular exposure time which corresponds to the selected aperture, it becomes possible for the operator to provide a selected exposure time as well as a selected aperture, if desired.

3,645,182

FILM WINDUP DEVICE FOR CAMERAS

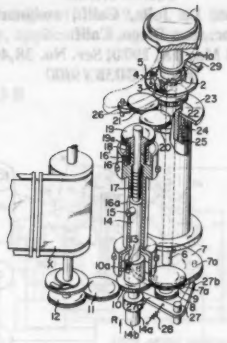
Shuji Kimura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 14, 1969, Ser. No. 866,189

Claims priority, application Japan, Oct. 18, 1968, 43/75624

Int. Cl. G03b *19/02, 1/06*

U.S. Cl. 95—31 AC **5 Claims**



With a film windup device of this invention, rotary motion of sprocket or sprocket shaft is transmitted to spool by way of clutch mechanism; shutter windup system is separated from sprocket and spool by using the rewind mechanism to allow the shutter to be wound alone; shutter is separated in the case of rewinding by rewind mechanism; only the sprocket can be rotated backward by the action of the aforementioned clutch without transmitting the backward rotation to the spool.

3,645,183

PHOTOGRAPHIC APPARATUS

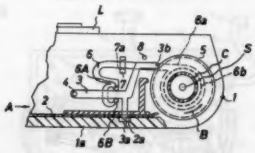
Karl Wagner, Ottobrunn, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 1, 1969, Ser. No. 881,057

Claims priority, application Germany, Nov. 30, 1968, P 18 11 906.7

Int. Cl. G03b *19/04*

U.S. Cl. 95—31 FM **10 Claims**



A still camera for use with roll film having a perforation for each film frame wherein a lever is pivotally mounted in the housing and includes a first arm which tracks the film and enters an oncoming perforation during transport of the film and a second arm which engages a gear and prevents further manipulation of the film transporting mechanism when the first arm enters a perforation. A displacing member which is turnable by the gear through the intermediary of a friction clutch disengages the first arm from the film and the second arm from the gear in response to actuation of the camera release. The film transporting mechanism is then free to advance the film whereby the gear turns the displacing member to move the first arm of the lever into engagement with the film and to cause entry of the first arm into the oncoming perforation when the transport of film by the length of a frame is completed.

3,645,184

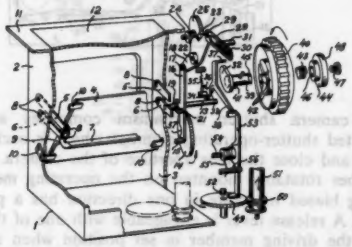
CONTROL DEVICE FOR VIEWFINDER MIRROR MECHANISM OF SINGLE-LENS REFLEX CAMERAS

Alf Ingvar Alfredsson, Savedalen, Sweden, assignor to Fritz Victor Hasselblad, Goteborg, Sweden

Filed Dec. 11, 1970, Ser. No. 97,189

Int. Cl. G03b *19/12*

U.S. Cl. 95—45 **6 Claims**



The viewfinder mirror mechanism of a single-lens reflex camera is provided with a control device comprising a cam disc settable to three different angular positions for controlling the viewfinder mirror mechanism at the release of the camera and at its cocking for a new exposure. The control device operates, for a first position of said disc, to fold up the viewfinder mirror upon release of the camera and folds the mirror down upon completion of said exposure; operates, for a second position of said disc, to fold up said mirror upon release of the camera and to return the mirror to its folded-down position when the camera is cocked for a new exposure; and, in the third position of said disc, does not actuate the viewfinder mirror mechanism, said mirror having been manually folded up prior to the exposure.

3,645,185

EXPOSURE TIME CONTROL DEVICE

Kiyoshi Kitai, 54, Tomihisa-cho, Shinjuku-ku, Tokyo, Japan

Filed Oct. 3, 1969, Ser. No. 863,571

Claims priority, application Japan, Oct. 3, 1968, 43/71734

Int. Cl. G03b *9/62*

U.S. Cl. 95—53 EB **11 Claims**

Different exposure times of a shutter-operating mechanism are obtained by variably coupling an inertia flywheel to the

driving wheel for the shutter opening and closing to retard the driving wheel and by impeding the rotation of the flywheel by an electromagnetic abutment lever under control of a timing circuit to obtain longer exposure times.

3,645,186

SHUTTER OPENING AND CLOSING MECHANISM

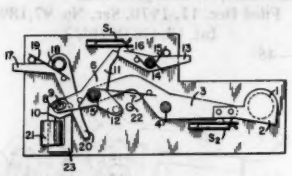
Kiyoshi Kitai, 54, Tomishisa-cho, Shinjaku-ku, Tokyo, Japan

Filed Dec. 8, 1969, Ser. No. 883,173

Claims priority, application Japan, Dec. 9, 1968, 43/89715

Int. Cl. G03b *9/00, 9/62*

U.S. Cl. 95—59 **7 Claims**



A camera shutter mechanism comprises a pivotally mounted shutter-operating member which is oscillatable to open and close the lens aperture of the camera. A driving member rotatably mounted on the operating member and spring biased to rotate in one direction has a plurality of arms. A release lever is engageable with one of the arms to hold the driving member in set position when the driving member is released, it is rotated by the spring and one arm acts against an abutment on one side of the axis of the driving member as a fulcrum to moving the operating member in a direction to open the shutter. For longer exposures, the driving member is held in shutter-open position by an electromagnetic magnet controlled by a timing circuit. Upon release by the electromagnet, the driving member rotates further in the same direction but fulcrums about an abutment engaging an arm on the opposite side of the axis of the driving member so that the operating member is pivoted in the opposite direction to close the shutter. Setting means engages an arm of the driving member to cock it while the operating member remains in shutter-closed position.

3,645,187

SHUTTER OPENING AND CLOSING DEVICE

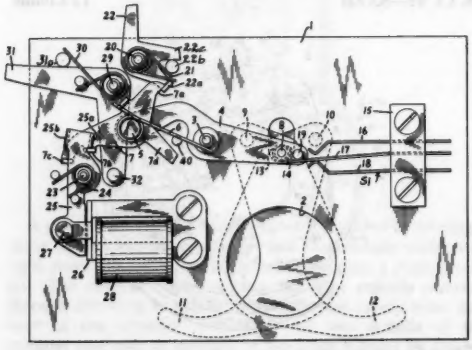
Kiyoshi Kitai, 54, Tomishisa-Cho, Shinjaku-ku, Tokyo, Japan

Filed Dec. 16, 1969, Ser. No. 885,474

Claims priority, application Japan, Dec. 18, 1968, 43/92541

Int. Cl. G03b *9/14*

U.S. Cl. 95—62 **12 Claims**



In a shutter mechanism, a driving member having a plurality of arms is rotatably mounted on a pivoted shutter operating member and is spring biased to turn relative to the operating member when released. In a first portion of its movement, the driving member engages an electronically controlled support member about which it pivots as a fulcrum so as to move the shutter-operating member in a direction to open the shutter. At the end of a selected exposure time the support member disengages from the driving member permitting it to rotate further in the same direction while engaging an abutment on the opposite side of the axis of the driving member so that the operating member is moved in the opposite direction to close the shutter.

3,645,188

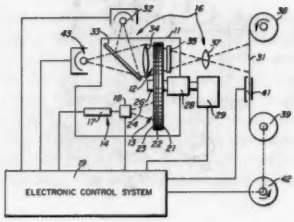
PROJECTING APPARATUS AND DISPLAY SYSTEM USING SAME

Omer F. Hamann, La Jolla, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed May 18, 1970, Ser. No. 38,403

Int. Cl. G03b *19/00*

U.S. Cl. 95—11 **4 Claims**



Apparatus is described for projecting successive images onto a light-sensitive surface. The apparatus includes an evacuated enclosure and at least two movable electron-sensitive image storage areas therein. The areas are movable in a manner which permits storing on one area while, at the same time, the image stored on the other area is being projected onto the recording surface.

3,645,189

FLASHGUNS

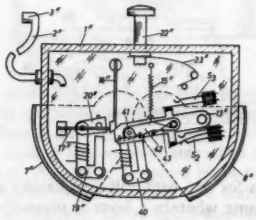
Waldemar T. Rentschler, and Winfried Espig, both of Calmbach, Black Forest, Germany, assignors to Prontor-Werk Alfred Gauthier G.m.b.H., Calmbach, Black Forest, Germany

Filed Mar. 11, 1969, Ser. No. 806,161

Claims priority, application Germany, Mar. 14, 1968, P 16 22 941.7

Int. Cl. G03b *9/58*

U.S. Cl. 95—11.5 R **7 Claims**



A flashgun using flashbulbs is provided for taking photographs by artificial light. The ignition of the flashbulb is initiated by the flash contact of the camera and an ignition circuit is connected to a primary coil of a transformer. The secondary coil of the transformer is connected to the firing

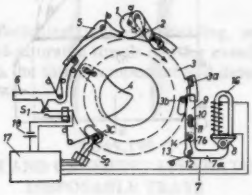
circuit of a thyristor which on conduction energizes an electromagnet of a locking device for holding a shutter in front of the flashbulb in the open position. An electronic switching device including a photosensitive resistor controls a holding magnet cooperating with the drive of the shutter for releasing the shutter at the end of a time interval formed by the electronic switching device in order to allow the shutter to close.

3,645,190

PHOTOGRAPHIC SHUTTER WITH AN ELECTRONIC TIMING DEVICE

Jorg Alfred Sohn, Wildbad, Germany, assignor to Prontor-Werk Alfred Gauthier G.m.b.H, Calmbach, Black Forest Germany

Filed Dec. 10, 1969, Ser. No. 883,961
Claims priority, application Germany, Dec. 12, 1968, P 18 14 120.3
Int. Cl. G03b 9/62
U.S. Cl. 95—53 R **3 Claims**



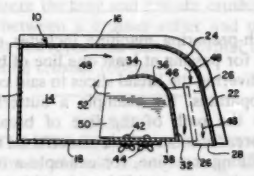
The photographic shutter has a reciprocating driving member for moving the shutter blades into open and closed positions. An electronic timing device controls a spring-biased two armed lever, one of the lever arms locks the driving member in the open position of the shutter blades and is advantageously designed to be bendable or collapsible. The bendable lever arm is located in the path of motion of a projection on the driving member so that the projection strikes against the end face of the lever arm before the reversal movement. The pin located on the shutter blade driving member is engageable with this lever arm to return the arm from a collapsing or bent position into an extended position at the end of the shutter closing action.

3,645,191

AIR SCREEN SPRAY NOZZLE

Gunnar C. Asker, and Maurice Hubscher, both of 18 Industrial Drive, Trenton, N.J.

Filed Aug. 14, 1969, Ser. No. 850,132
Int. Cl. F24f 9/00
U.S. Cl. 98—36 **6 Claims**



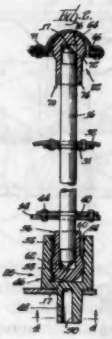
An adjustable nozzle is provided which cooperates with air ducting to deflect and remove turbulence from a stream of air and convert the same adjustably into an air screen of desired thickness and quality with homogeneous airflow.

3,645,192

WIND BRACED TURBINE

Donald L. Rousey, Des Plaines, Ill., assignor to Questor Corporation, Toledo, Ohio

Filed June 1, 1970, Ser. No. 41,975
Int. Cl. F23l 17/02
U.S. Cl. 98—75 **8 Claims**



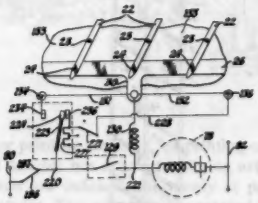
A wind braced turbine ventilator having a turbine head supported by an upwardly extending central shaft which sharply tapers to a point at each end thereof. The shaft is rotatably mounted to a stationary support structure through a pair of self-aligning bearing assemblies. The bearing assemblies comprise substantially spherical bearings having cavities therein for receiving the pointed ends of the central shaft so as to allow the latter to rotate freely therein. In addition, the bearings are mounted to the stationary support structure for movement relative thereto, which movement allows the bearings to remain in c0ntinuous alignment with each other for minimizing frictional drag.

3,645,193

CONTINUOUSLY VARIABLE AIR DEFLECTOR

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 10, 1970, Ser. No. 53,815
Int. Cl. E06b 7/08
U.S. Cl. 98—94 **4 Claims**



In the preferred form, a fluid discharge from an air conditioner is provided with a series of parallel pivoted vanes connected to pivot in unison by a lateral connecting bar. One or two electrically energizable thermally expansible hot resistance wires are connected between the fluid discharge and the connecting bar. These wires are periodically electrically heated by current from the supply circuit which is in series with a periodically opening timing switch.

3,645,194

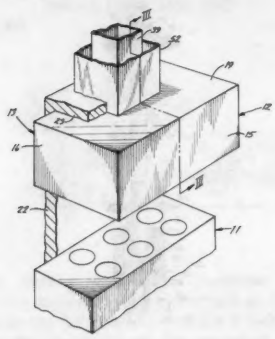
BAFFLED VENTILATING HOOD

Willard K. Ahlrich, 101 North Riverview Drive, Parchment, Mich.

Continuation-in-part of application Ser. No. 739,518, June 24, 1968, now Patent No. 3,513,766. This application Mar. 16, 1970, Ser. No. 19,913

Int. Cl. F23j *11/02*

U.S. Cl. 98—115 10 Claims



A hood structure for exhausting fumes and/or hot gases from food cooking below the hood structure, which includes an exhaust chamber connected to a gas-moving assembly for discharging the fumes. An air supply chamber is also connected to said gas-moving assembly for replacing the discharged air with relatively fresh air. The airflow and volume are carefully controlled to assure movement of the supply air and fumes in a pattern which will not adversely affect the temperature or other characteristics of the food being cooked, but will prevent the fumes from escaping into the room or space around the hood.

3,645,195

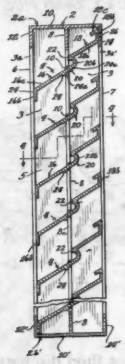
VENTILATING LOUVER UNIT

Robert J. Koval, Forest Park, Ill., assignor to Vent Products Co., Inc., Chicago, Ill.

Filed Apr. 9, 1970, Ser. No. 26,812

Int. Cl. F24f *13/08*

U.S. Cl. 98—121 7 Claims



A ventilating louver unit having a peripheral frame defining and surrounding an interior space opening onto the front and rear of the unit. The peripheral frame has sidewalls having correspondingly inwardly extending outer flanges at the front and rear margins thereof and vertical ribs extending inwardly between the flanges. Louver blades pass through corresponding vertically spaced slots in said inwardly extending ribs and are wedged between the front and rear sidewall flanges. Each louver blade has a forwardly projecting rain-shield-forming portion resiliently urged against the rear surfaces of the ribs above each of the associated slots.

3,645,196

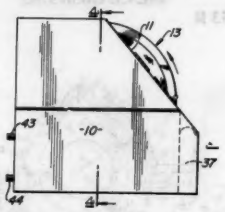
FRENCH FRYING MACHINE HAVING ROTARY FOOD-CONVEYING DRUM

William D. Johnston, and William J. Long, both of Franklin County, Ohio, assignors to White Castle System, Inc., Columbus, Ohio

Filed Mar. 9, 1970, Ser. No. 17,576

Int. Cl. A47j *37/12*

U.S. Cl. 99—404 2 Claims



A French frying machine in which a generally horizontally disposed, axially rotatable drum is employed to convey batches of food to, through, and from a vat or well of hot cooking oil, the food-conveying drum having a plurality of circumferentially adjoining, but separate, food-receiving pockets or compartments so constructed as to automatically discharge the cooked food therefrom by gravity as it leaves the cooking oil.

3,645,197

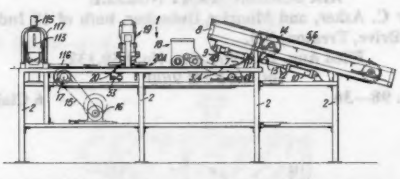
SANDWICH-PREPARING MACHINES

James Stark McMeekin, Killearn, and James Wilson Galloway, Glasgow, both of Scotland, assignors to Sandwiches (Glasgow) Limited, Glasgow, Scotland

Filed Dec. 31, 1969, Ser. No. 889,625

Int. Cl. A23p *1/00*

U.S. Cl. 99—450.4 27 Claims



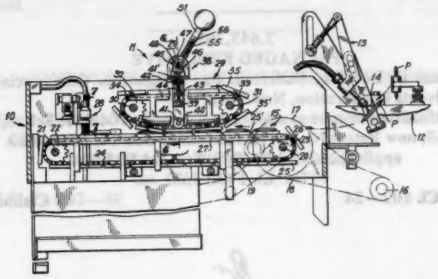
A sandwich-preparing machine includes an endless conveyor system for passing at least one line of bread slices, and means for delivering the bread slices to said conveyor system. Spreading apparatus, for example a buttering machine, is located over the path of the line of bread slices and is adapted to spread viscous edible material on the bread slices. A sandwich-filling machine, for example a meat slicing and depositing machine, is provided, and at this machine the conveyor system is comprised by two parallel conveyor lines, the filling machine passing filling material onto the bread slices of one line. A side-by-side pair of receivers for the bread slices are located at the end of the conveyor system, and one receiver is pivotal to place its bread slice on the bread slice of the other receiver to form a sandwich.

3,645,198

METHOD FOR FORMING LIQUID SATURATED TOWELETTE PACKETS

Donald G. Field, Trenton, N.J., assignor to Holland-Rantos Company, Inc., Piscataway, N.J.

Filed Mar. 24, 1970, Ser. No. 22,274
Int. Cl. B30b *13/00, 5/04*
U.S. Cl. 100—35 3 Claims



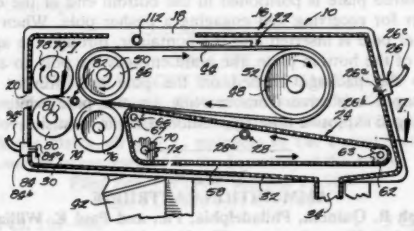
Method for flattening, without wrinkling, sealed packets containing liquid-saturated towels and for evenly distributing the liquid within the towel component and detecting leaks in said packets.

3,645,199

WASHER AND CRUSHING APPARATUS FOR DISPOSABLE TRAYS

Leslie J. Kanna, West Chicago, Ill., assignor to Mass Feeding Corporation, Elk Grove Village, Ill.

Filed Nov. 13, 1970, Ser. No. 89,246
Int. Cl. B30b *7/00*
U.S. Cl. 100—70 R 13 Claims



The apparatus washes and crushes disposable metallic food trays. The trays are placed on a first conveyor, and they are inverted as the are dropped onto a second conveyor located below the downstream end of the first conveyor. A spray of water is directed onto the trays, both as they are falling from the first conveyor and after they have assumed an inverted position on the second conveyor. The second conveyor transports the tray into engagement with the return run of the first conveyor to squeeze the tray and initiate crushing. The tray is first crushed between a crusher roller and the upstream roller for the first conveyor and then is further crushed by a pair of supplemental crusher rollers.

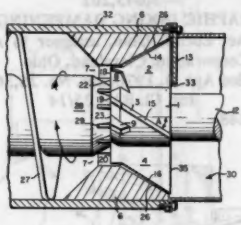
3,645,200

STOCK CUTTER FOR ELASTOMER DRYING PRESS

Wayne Edward Craddock, and Stanley George Smith, both of Beaumont, Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 9, 1970, Ser. No. 9,587
Int. Cl. B30b *9/00*
U.S. Cl. 100—98 5 Claims

In a screw-type drying press for drying elastomeric polymers wherein the elastomer is discharged from the press into a discharge chamber, the elastomer is subdivided into pieces as it leaves the screw press by a stock cutter consisting essentially of (a) a hub rotatably mounted on the axis of the screw press in the discharge chamber immediately adjacent to the exit of the screw press; and (b) at least one blade attached to the outer periphery of the hub positioned at an angle of 1–60° to the rotational axis of the hub with the dependent portion of the blade generally shaped to conform to



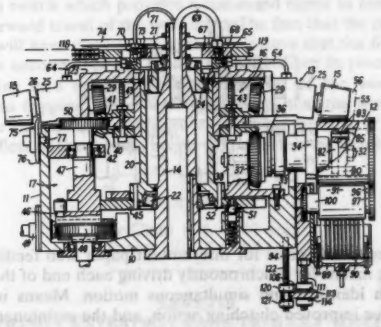
the shape of the discharge chamber. During rotation the blade subdivides the elastomeric stock, wipes the inside surface of the discharge chamber, and propels the subdivided stock away from the press discharge area. Alternatively, this stock cutter is used in combination with a stationary knife positioned at the exit of the stock cutter particularly when processing elastomeric stocks which have a Mooney viscosity [*ML* 1+4 (121° C.)] of 10 to 45 when dry.

3,645,201

MULTICOLOR PRINTING MACHINE FOR CYLINDRICAL AND FRUSTOCONICAL OBJECTS

John Maxwell Jackson, Potters Bar, England, assignor to Max Jackson Developments Limited, Hertfordshire, England

Filed May 13, 1970, Ser. No. 36,889
Claims priority, application Great Britain, May 13, 1969, 24,437/69
Int. Cl. B41f *17/28*
U.S. Cl. 101—38 A 6 Claims



A multicolor printing machine for printing on frustoconical or cylindrical articles has a turret carrying article-supporting mandrels which are indexed alternately at printing stations and drying stations. The mandrels are rotated in synchronism with printing cylinders at the printing stations by two bevel gears rotatable in unison about the rotational axis of the turret, the mandrels and cylinders being rotatable about axes substantially radial to the turret axis and the distance between the bevel gears being adjustable to accommodate different sizes of mandrels and printing cylinders. Each printing cylinder is located in position on its drive shaft by axial and radial abutments adjustable to correct any misalignment. During printing the inking mechanism is driven by the printing cylinders, but when the machine is stopped the inking

mechanism is separated from the cylinders and driven independently to prevent drying of the ink on the inking rollers. During printing each article is held onto the mandrel by vacuum. After printing is completed, the vacuum is released, the article is nudged by a roller during rotation of the turret to loosen its grip on the mandrel, and the article blown off by compressed air.

3,645,202

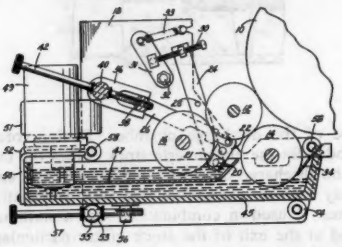
LITHOGRAPHIC INKING DAMPENING SYSTEM

Francis K. Lake, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Apr. 3, 1970, Ser. No. 25,507

Int. Cl. B41l *25/14*

U.S. Cl. 101—148 **4 Claims**



Ink and moisture rollers transport directly from their supply source to a form roller and metering means therefor also the arrangement of the rollers to each other and to the master cylinder.

3,645,203

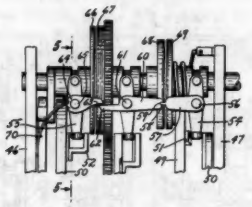
PRESS FOR WEB PRINTING HAVING INTERMITTENT PAPER-FEEDING MEANS

Fred M. Slavic, 220 Fifth Ave., New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,188

Int. Cl. B41l *13/02*

U.S. Cl. 101—228 **2 Claims**



An improved press for intermittent paper web feeding including means for synchronously driving each end of the web through identical and simultaneous motion. Means is provided for improved clutching action, and the maintenance of a variable loop in the web existing between a continuously rotating paper feed supply and the incremental web-feeding means.

3,645,204

METHODS OF PREPARING AND COMPOSING RELIEF PRINTING MEMBER

Earl J. Gosnell, Rochester, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 15, 1967, Ser. No. 668,133

Int. Cl. B41c ; B41n

U.S. Cl. 101—401.1 **11 Claims**

An improved latently composable printing member and methods of preparing and composing the same. A heat sensitive polymer dispersion coating on a dimensionally stable base is placed in thermal contact with infrared absorbing indicia. Selective heating of the coating through the application of near infrared radiation to the absorbing indicia causes the polymer dispersion coating to form an insoluble solid solution in a pattern corresponding to the indicia on the master. The portions of the coating which do not form a solid solution are washed off the base with a solvent to form a relief printing plate.

3,645,205

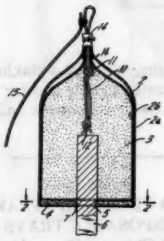
PACKAGED EXPLOSIVE

Thomas P. Dowling, Fullerton, Pa., assignor to Commercial Solvents Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 704,037, Feb. 8, 1968, now Patent No. 3,472,166, dated Oct. 14, 1969. This application May 8, 1969, Ser. No. 823,004

Int. Cl. F42b *3/00*

U.S. Cl. 102—24 **18 Claims**



Packaged explosives of the type known as bombing charges are provided. The packaged explosive is composed of a flexible container filled with a deformable explosive. An apertured plate is positioned in the bottom end of the container for receiving and engaging a pusher pole. When the pusher pole is inserted into the container, through the aperture of the bottom plate, the plate engages the pole so as to keep the package aligned on the pole and prevent the packaged explosive from rotating on the pole while the packaged explosive is being positioned at the blast site.

3,645,206

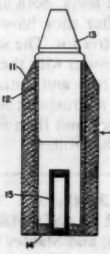
AMMUNITION CARTRIDGE

Joseph B. Quinlan, Philadelphia, Pa., and Paul E. Williams, Elinton, Ill., assignors to The United States of America as represented by the Secretary of the Army

Filed Feb. 19, 1970, Ser. No. 12,659

Int. Cl. F42b *5/18*

U.S. Cl. 102—40 **4 Claims**



A caseless ammunition cartridge having a completely combustible ignition system for providing improved propellant surface area breakup and ignition in larger caliber ammunition. The ignition system includes a base end plug secured in the rearward end of a propellant support tube which is sur-

rounded by a cylindrical molded charge and has a projectile secured in its forward end. A molded propellant cylinder has one end seated in the base end plug and a propellant tube bonded to its inner surface. A primer assembly has with the propellant cylinder one end, a primer cup containing a primer pellet and a combustible primer seal. A booster assembly has within the other end of the propellant cylinder a booster cup containing an explosive charge and a booster seal.

3,645,207

COMBUSTIBLE MOISTUREPROOF PERCUSSION PRIMER

Edward S. Daniels, Port Clinton, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed May 6, 1969, Ser. No. 822,238
Int. Cl. F42b *5/18, 19/08*
U.S. Cl. 102—40 **5 Claims**

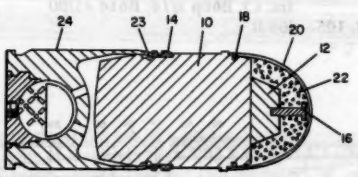
A percussion primer for initiating firing of a cartridge which is fully combustible and which is impervious to moisture vapor. The primer mix is contained in a consumable moistureproof sealed cup-shaped closed member received in a molded propellant support and backed against a molded propellant anvil which function together as a unit attachable to a cartridge.

3,645,208

FUZELESS TARGET PRACTICE CARTRIDGE

John Weinssen; James A. Carrazza; Seymour M. Kaye, all of Dover; John Hoerter, Chatham, and Garry Weingarten, Morris Plains, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Feb. 17, 1970, Ser. No. 11,989
Int. Cl. F42b *13/14, 13/44*
U.S. Cl. 102—66 **9 Claims**



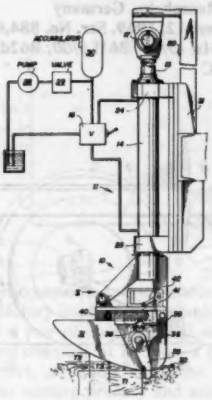
A fuzeless target practice cartridge to produce a flash and smoke signal, upon impact of the projectile with the target. This is accomplished by the use of a controllably sensitized pyrotechnic composition, reactive on impact or abrasion, and an ogive-anvil-spike configuration designed to easily rupture upon a low-force impact. The system is made functional by a proper balancing of the sensitivity of the composition and the design of the ogive-anvil-spike configuration depending on the impact force available.

3,645,209

TIE INDEXERS

Helmuth Rolf Erich Von Beckmann, Columbia, S.C., assignor to Tamper, Inc., West Columbia, S.C.

Filed Oct. 2, 1970, Ser. No. 77,438
Int. Cl. E01b *37/00*
U.S. Cl. 104—12 **6 Claims**



A tie-indexing device suitable for use on tamping machines, which projects beneath the machine and is biased downwardly into the ballast by hydraulic pressure so that the indexer plows through the ballast. A profiled edge is provided on a ballast-engaging shoe at the bottom of the indexer such that as the machine moves forward and the indexer plows through the ballast the profiled edge engages a tie and climbs up and over the tie against the biasing action of the hydraulic pressure. An indexing finger is pivotally mounted on the side of the shoe and projects beneath the bottom profiled edge such that on encountering the edge of a tie during forward motion of the vehicle the indexer is pivoted and trips a switch which provides a command signal to terminate the forward travel of the workhead. The fact that the profiled edge will have climbed on to the tie insures that the finger is always encountered at a uniform position from its pivot point resulting in a uniform distance of travel of the workhead prior to tripping the switch. This insures that the workhead will be stopped at a uniform distance from the edge of the tie regardless of the vertical height of that tie on the roadbed.

ERRATUM

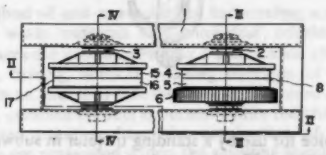
For Class 104—149 see:
Patent No. 3,646,613

3,645,210

SPRING CENTERING CRANE TROLLEY WHEELS

Tatsumi Tanaka, 225-4 Zaimo-ku-cho, Saga, Japan

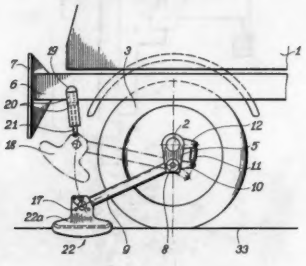
Filed Feb. 3, 1970, Ser. No. 8,384
Int. Cl. B60b *17/00;* **B66c** *9/14, 9/16*
U.S. Cl. 105—163 R **2 Claims**



Crane trolley comprising stub axle mounted wheels which are resiliently spaced from the supporting frame. The rollers

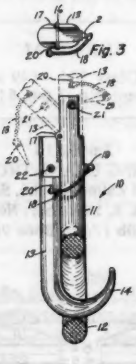
may be hollow, and contain oil boxes, bearings, and spacing springs.

3,645,211
CONVERTIBLE RAIL-HIGHWAY VEHICLE
Herbert Gretzschel, Lochham; Walter Schneider, Witzhelden, and Theodor Schmauder, Schlossberg, all of Germany, assignors to Martin Beifhack Maschinenfabrik und Hammerwerk G.m.b.H., Rosenheim, Germany
Filed Dec. 12, 1969, Ser. No. 884,622
Int. Cl. B61d *15/00*; B61f *9/00*; B62d *61/12*
U.S. Cl. 105—215 C **27 Claims**



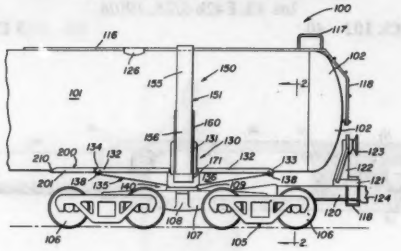
A convertible rail-highway vehicle comprises two frames which are pivoted to the front and rear axles and carry sets of rail-engaging shoes or rollers. The frames are always concealed below the body of the vehicle and are pivotable between raised positions in which the shoes or rollers are out of the way and lowered positions in which the shoes or rollers engage the rails in immediate proximity of the respective wheels to hold the wheels against movement off the top surfaces of the rails. The frames can be locked in their lowered positions and the shoes or rollers are mounted thereon with some freedom of movement about vertical and/or horizontal axes.

3,645,212
STRAPHANGERS DEVICE
Selim V. Dahlstrom, 143 Prospect St., Waldwick, N.J.
Filed Mar. 4, 1970, Ser. No. 19,149
Int. Cl. B65g *7/12*; B61d *49/00*
U.S. Cl. 105—354 **1 Claim**



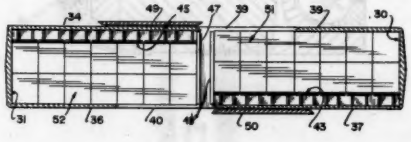
The device for use by a standing traveler in subways, buses or other vehicles. The device serves to aid a person of short stature to reach the overhead strap or support bar in vehicle. The device includes a hooked rod and a hingeable second rod and the handle grip, the hook serving to engage the overhead strap or support bar in the vehicle. The device also includes an attached chain and pin, the pin serving to lock the two bars in alignment and also serves to lock the two bars when in the folding compact position for carrying.

3,645,213
SUPPORT STRUCTURE FOR TANK CAR
William A. Taylor, Sharpsville, Pa., assignor to General American Transportation Corporation, Chicago, Ill.
Filed Jan. 23, 1970, Ser. No. 5,265
Int. Cl. B61d *5/06*
U.S. Cl. 105—362 **11 Claims**



A support structure for a railway tank car including a fluid-tight tubular body shell, first and second truck saddle structures positioned adjacent to the outer ends of the body shell for supporting the same upon associated trucks each carrying draft connections, first and second external support rings respectively surrounding the body shell and first and second elongated support structures respectively positioned between the first and second support rings and the body shell, the elongated support structures being attached along the free side edges thereof at spaced-apart points therealong to distribute stress into the body shell at a corresponding plurality of points.

3,645,214
COMPARTMENT ARRANGEMENT FOR RAILWAY CARS
Gerald McLaughlin, Western Springs, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.
Filed July 5, 1966, Ser. No. 566,701
Int. Cl. B60p *7/14*; B61d *45/00*
U.S. Cl. 105—369 B **1 Claim**



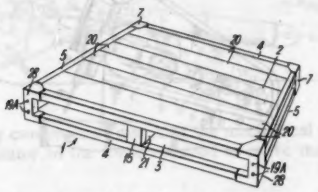
A railroad car having side doorways which are offset from one another towards different ends of the car such that each doorway is positioned opposite a fixed, immovable sidewall of the car. The interior of the car is fitted with two transverse bulkheads or "load dividers" which may be moved longitudinally within the car. A set of "side filler" bulkheads is positioned along each car sidewall.

3,645,215

BOX STRUCTURES, PARTICULARLY PALLETS

Thomas James Kirkpatrick, 14 Aberdelghy Gardens, Lambeg, Lisburn, Northern Ireland

Filed Dec. 22, 1969, Ser. No. 886,993
Claims priority, application Great Britain, Feb. 15, 1969, 8,362/69
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 16 Claims



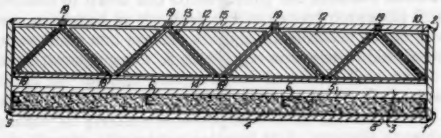
A pallet comprising top and bottom floors, a pair of side frames and a pair of end frames connectable together to form a box frame which when it is assembled is adapted to hold the top and bottom floors in position. Each of the frames has a pair of parallel longitudinal grooves, whereby when the box frame is assembled a pair of peripheral grooves are formed which serve for retaining the floors in position.

3,645,216

SAFES AND SIMILAR SECURITY STRUCTURES

Arthur S. Radford, Wolverhampton, and Ronald J. Brown, Oakengates, both of England, assignors to Chubb & Son's Lock and Safe Company Limited, Wolverhampton, Staffordshire, England

Filed Jan. 29, 1970, Ser. No. 6,758
Claims priority, application Great Britain, Feb. 3, 1969, 5,728/69
Int. Cl. E05g *1/02*
U.S. Cl. 109—82 8 Claims



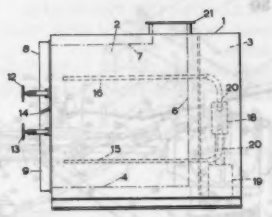
A slab or panel for use in a safe or similar structure comprises a layer of material resistant to drilling and other forms of mechanical attack backed by a layer of material, preferably graphite, which melts and vaporizes but does not substantially react exothermically with oxygen at the temperatures generated by a thermic lance, i.e., of the order of 3,000° C. The melting and vaporization involves the provision of such large amounts of latent heat thus taking several times as long to burn a hole through the slab. The material for resisting mechanical attack preferably comprises nuggets of heard material in a ductile metal matrix and a convenient form of construction there is a single layer of this material and a single layer of the vaporizable material. The vaporizable material is preferably in the form of blocks of triangular section fitted into compartments defined by metallic spacing members supported between a pair of steel plates.

3,645,217

INCINERATORS

Peter Robert Akroyd, Harrogate, England, assignor to P. R. Akroud Limited, Harrogate, Yorkshire, England

Filed Feb. 24, 1970, Ser. No. 13,655
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 A 10 Claims



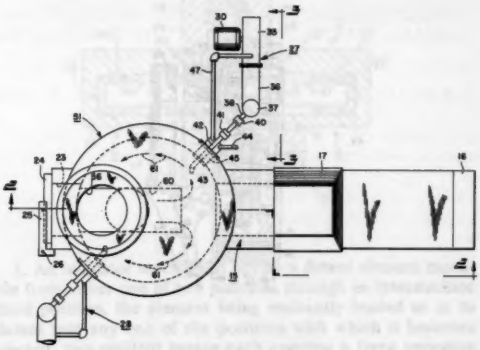
The invention comprises an incinerator for burning refuse including a refractory lined front combustion chamber closed at the front by a pair of doors located one above the other and a secondary chamber at its rear, a baffle wall between the two chambers, air ducts along the sides of the combustion chamber venting primary and secondary air through said lining, fan means for supplying said air, a flat hearth for the combustion chamber, and a smoke outlet flue preferably from the secondary chamber. The smoke can be baffled in the secondary chamber to provide a duct and debris settling region and there can be a burner for unburned gases.

3,645,218

SOLID WASTE INCINERATOR

Leonard A. Davis, Mentor, Ohio, assignor to Garver-Davis Incorporated, Cleveland, Ohio

Filed May 12, 1970, Ser. No. 36,636
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 R 19 Claims



A method of and apparatus for incinerating a wide range of solid waste materials in a smokeless, odorless manner, Solid wastes are contained within a combustion chamber in a whirling, driving, vortical, rotating envelope of air that is present in an excess of that theoretically required to burn the waste. A combustible fuel is burned within the chamber. The particulates resulting from the combustion of the waste materials are suspended within the resulting burning cyclone of air and fuel, burned, and the effluent vented from the combustion chamber. Preferably, an afterburner is used to

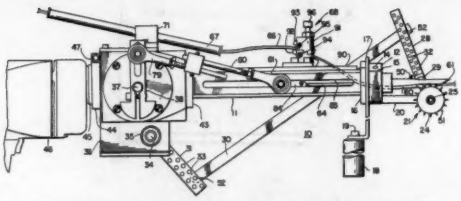
burn any lighter weight particulate matter that may escape from the combustion chamber.

3,645,219

HANDGUN FOR MAKING CUT PILE FABRICS AND THE LIKE

D. L. Jenkins, Box 44, Dalton, Ga.

Filed Nov. 6, 1970, Ser. No. 87,440
Int. Cl. D05c *15/08*
U.S. Cl. 112—80 **9 Claims**



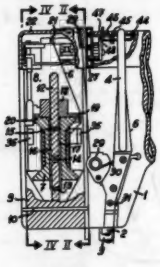
A motor-operated handgun for making designs in carpet and the like and for forming cut pile fabrics by hand including mechanical latching arrangement for locking the yarn while the yarn is cut to produce a cut pile face and an adjustable yarn feed mechanism capable of being set to control the number of stitches per inch.

3,645,220

BOBBIN MOUNT FOR SEWING MACHINE

Ramon Casas-Robert, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Nov. 24, 1969, Ser. No. 879,418
Claims priority, application Switzerland, Dec. 6, 1968, 18239/68
Int. Cl. D05b *43/00*
U.S. Cl. 112—218 R **7 Claims**



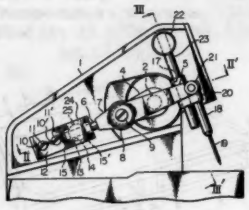
A sewing machine wherein the upper thread spool is held fast on its spindle within the housing provided for it while the thread is wound off the spool in a direction extending substantially in alignment with the spool axis. The cover of the housing may be shifted outwardly together with the spindle which is secured to it to allow removing and replacing the spool. A cap-shaped member fitted loosely over the spool includes a broad flange guiding the thread as it passes off the spool while means are provided to lock the cover in its closed position and to lift the cap-shaped member off the spindle before releasing the cover.

3,645,221

NEEDLE OPERATION DEVICE IN HIGH-SPEED SEWING MACHINES

Tetsuro Hirayama, Tokyo, Japan, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 11, 1970, Ser. No. 71,314
Int. Cl. D05b *55/14*
U.S. Cl. 112—221 **4 Claims**



A needle operation device in high-speed sewing machines comprising a crank integrally formed with a reciprocating shaft rotatably mounted in the machine frame of said sewing machine, an actuating arm mounted on said crank for rocking movement relative to the crank, a slide pivoted to one end of said actuating arm and having a sewing needle secured thereto and a mounting member adjustably secured to said machine frame and rotatably receiving a bearing therein, said bearing slidably receiving the other end of said actuating arm.

3,645,222

SELF-THREADING SEWING MACHINE NEEDLE

Josef Zocher, Haaren, Aachen, Germany, assignor to The Singer Company, New York, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,055
Int. Cl. D05b *87/00*
U.S. Cl. 112—224 **8 Claims**

A sewing machine needle is disclosed in which a threading slot extends lengthwise along the needle blade and opens onto the needle eye. A twist is formed in the needle blade so that the portions of the needle blade which are separated by the threading slot are wrapped about each other and stabilized thereby.

3,645,223

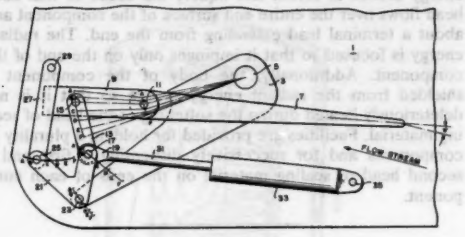
HYDROFOIL FLAP CONTROL SYSTEM

Philip C. Whitener, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 16, 1970, Ser. No. 81,301
Int. Cl. B63b *1/28*
U.S. Cl. 114—66.5 H **6 Claims**

An actuator is connected to a combined hydrofoil and flap, through a bell crank-lever linkage. A change in the foil angle

of attack produces a coincident change in the flap angle. Also the bell crank-lever linkage is connected to the actuator to minimize the effect of the flow stream force on the foil



and flap by continuously matching the mechanical advantage of the actuator to the force required to move the flap and foil.

3,645,224

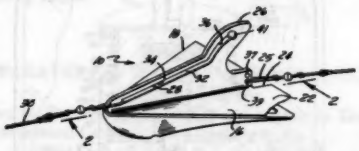
UNDERWATER PLANING DEVICE

Sylvester Haberman, 8515 Forest Grove, Houston, Tex.

Filed Mar. 2, 1970, Ser. No. 15,662

Int. Cl. B63b *21/00*

U.S. Cl. 114—235 B **12 Claims**



A device designed to travel through water at any of a plurality of depths by means of being towed from a conventional water craft wherein the device may be utilized as a sinker to maintain fishing tackle at a desired depth or as a transporter vehicle for transporting fluids, or the like, beneath the surface of the water. A towline is connected to the device such that the point of attachment of the towline to the device may be readily adjusted. The position of the attach point determines the angular orientation of the device relative to the direction of travel and consequently the effective downward force produced by the device. Fins extend outwardly from a hollow body and provide attitude stabilization as the device travels through water. A diaphragm arranged within the body defines an internal compartment in which fluid could be transported. Pressure equalization means in the form of vents equalize the pressure between the interior and exterior of the body thereby eliminating external static pressure considerations from the structural design and consequently allowing the device to travel at the desired depth.

3,645,225

ROUGH-WATER TOWING SYSTEM

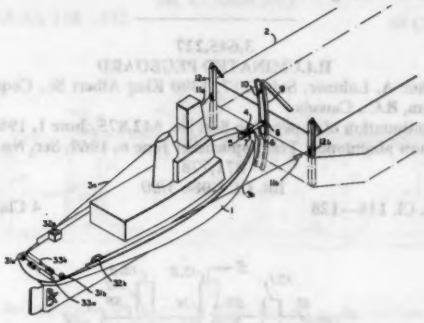
Thomas T. Lunde, 6 Locksley Ave., San Francisco, Calif.

Filed Sept. 17, 1969, Ser. No. 858,829

Int. Cl. B63b *21/00*

U.S. Cl. 114—235 R **14 Claims**

A pusher towboat normally propels a load carrying vessel by pushing contact at the centerline of the stern of the vessel with a towboat-mounted shock absorbing pusher knee. A pair of tensioned rapidly detachable tiller lines interconnecting the vessel and the stern of the towboat lash the vessel and towboat together with a force substantially greater than the astern power of the towboat and stores energy in the pusher knee to rapidly separate towboat and vessel upon detachment of the tiller lines. A connected, but normally nonoperational, pull-towline enables pull-tow control of the vessel upon tiller line detachment. The points of connection of the tiller lines to the vessel, the point of pushing contact between towboat and vessel, and the points of connection of the tiller lines to the stern of the towboat lie in substantially



the same horizontal plane. Relative length of the two tiller lines is adjustable under load but at equal tension, so that towboat thrust is available for steering the load carrying vessel by a variation in longitudinal alignment of the towboat with respect to the vessel.

3,645,226

INDICATOR MECHANISMS

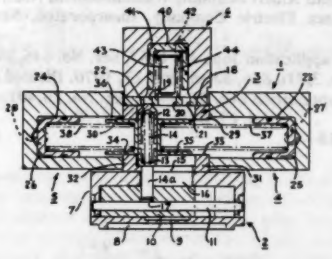
Michael Richard Mays, and Philip Norman Paginton, both of London, England, assignors to Westinghouse Brake and Signal Company, Limited, London, England

Filed Aug. 10, 1970, Ser. No. 62,552

Claims priority, application Great Britain, Sept. 19, 1969, 46,247/69

Int. Cl. G01l *19/12*

U.S. Cl. 116—70 **10 Claims**



1. An indicator mechanism having a detent element movable from either one of two positions through an intermediate third position, the element being resiliently loaded so as to detent into any one of the positions with which it becomes aligned, two resilient means each exerting a force opposing that exerted by the other resilient means, the force exerted by one of the means urging the element towards one of said two positions and the force exerted by the other of the means urging the element towards the other of said two positions, two force-increasing means one associated with each of the resilient means whereby the force exerted by the associated resilient means can be caused to increase to a value sufficient to overcome the combination of the force exerted by the other of the resilient means and the resilient loading of the element when it is detented in that one of said two positions from which the associated resilient means is urging the element towards the other of the two positions, the intermediate

third position being so located that before the element reaches said other of the two positions it becomes aligned with and detents into the third position from which third position it can be released to continue its movement to said other of the two positions only by the application to the element of an opposing force sufficient to overcome the resilient loading on the element.

3,645,227

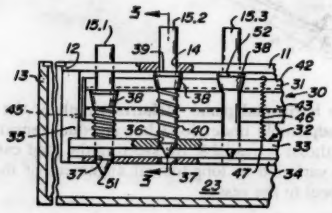
ILLUMINATED PEGBOARD

Arthur A. Lahmer, Suite 217, 1300 King Albert St., Coquitlam, B.C., Canada

Continuation of application Ser. No. 642,875, June 1, 1967, now abandoned. This application June 6, 1969, Ser. No. 871,778

Int. Cl. G08b 5/00

U.S. Cl. 116—128 **4 Claims**



A peg or annunciator board device for offices and plants to indicate disposition of personnel. Aligned rows of pegs of light-transmitting material which glow, when pressed inwards, from light from a source within the device. Automatic latching of a single peg or group of pegs when pressed inwards and individual or multiple peg release.

3,645,228

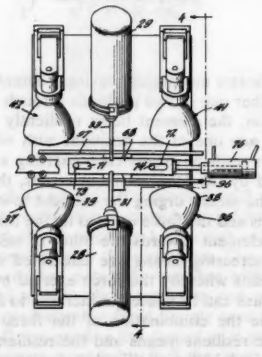
APPARATUS FOR SEALING THE ENDS OF ELECTRICAL COMPONENTS

Wilhelm Emil Albert Schmidt, Winston-Salem, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Original application June 15, 1967, Ser. No. 646,360, now Patent No. 3,516,856, dated June 23, 1970. Divided and this application Feb. 27, 1970, Ser. No. 18,401

Int. Cl. B05c 1/02, 11/10

U.S. Cl. 118—2 **5 Claims**



An apparatus for sealing the ends of electrical components which may be adversely affected by the heating thereof. A plurality of components are held in parallel relationship with one end facing upwardly and a bead of sealing material, such as an epoxy, is successively deposited on each end thereof. The beads of sealing material are then heated by a radiant energy source to soften and liquefy the beads so that each bead flows over the entire end surface of the component and about a terminal lead extending from the end. The radiant energy is focused so that it impinges only on the end of the component. Additionally, the body of the component is shielded from the radiant energy source so that it is not deleteriously heated during the softening of the bead of sealing material. Facilities are provided for holding a plurality of components and for successively dispensing a first and a second bead of sealing material on the ends of each component.

3,645,229

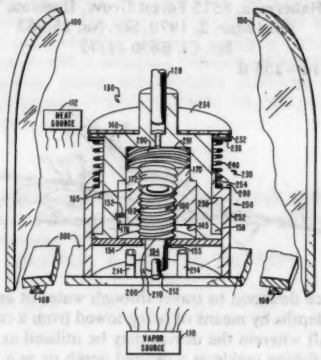
ROTATIONAL MECHANISM

Richard R. Phinney, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,351

Int. Cl. C23c 13/12

U.S. Cl. 118—48 **14 Claims**



A rotational mechanism is used, e.g., in a vacuum deposition apparatus, for suspending a substrate holder above its stationary supports for rotation free of any bearings within a heated portion of a vacuum chamber. At the beginning of the vacuum deposition cycle a shaft in the rotational mechanism is rotated to enable the mechanism to engage the substrate holder and lift it above its stationary supports due to inertia of the substrate holder. The substrate holder is then rotated during the vacuum deposition, after which the direction of rotation of the shaft is reversed, and the substrate holder is lowered onto its support member, again due to inertia, thus eliminating bearing contact among the rotational mechanism, the substrate holder, and the stationary supports during the vacuum deposition.

3,645,230

CHEMICAL DEPOSITION APPARATUS

William B. Hugle, Palo Alto; Donald G. Pedrotti, Cupertino, and William F. Perrine, Sunnyvale, all of Calif., assignors to Hugle Industries, Inc., Sunnyvale, Calif.

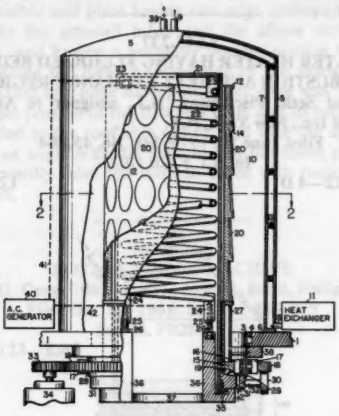
Filed Mar. 5, 1970, Ser. No. 16,796

Int. Cl. C23c 13/08

U.S. Cl. 118—49.5 **5 Claims**

A vertical flow-type deposition apparatus, typically for growing semiconductor layers, including epitaxial layers, upon a large plurality of substrates at one time. These are carried, vertically disposed, upon the outside of a rotatable barrellike susceptor, while an induction heating coil is within

the susceptor. Vapors or gases for processing are admitted at the bottom of a water-cooled enclosure and are exhausted at



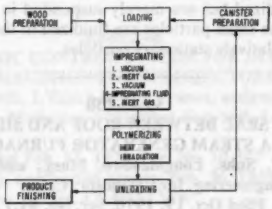
the top. The coil is separated from the processing volume by a refractory shield.

3,645,231

APPARATUS FOR PRODUCING WOOD-PLASTIC COMPOSITES

Lawrence G. Barrett, Lynchburg, Va., assignor to The American Novawood Corporation, Lynchburg, Va.

Filed Oct. 27, 1967, Ser. No. 678,584
Int. Cl. C23c *13/08*
U.S. Cl. 118—50.1 **20 Claims**



A system for converting wood to a wood-plastic composite in which the steps of pressure impregnation of the wood with a monomer and polymerization of the monomer within the wood by either heat or irradiation is accomplished in a single container.

The system includes an apparatus by which a thin walled container is able to withstand the internal pressure of monomer impregnation and a method and apparatus for handling the container in the polymerization processes.

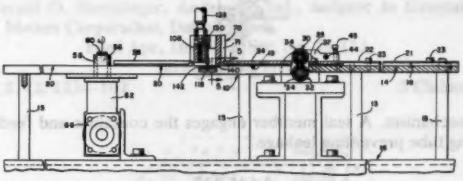
The system further includes an irradiation tank equipped with an irradiation absorbing fluid recirculation system for bacteria control and an inert gas system for displacing the irradiation absorbing fluid from between the submerged containers and the irradiation source. The irradiation source includes a plurality of line sources variable in spacing and in the intensity of irradiation. Means are provided to overcome the spatial variation in radiation produced by the discrete line sources by a time oscillation of the array of line sources with respect to the container.

3,645,232

APPARATUS FOR SIMULTANEOUSLY APPLYING A PLURALITY OF COATINGS TO A SUBSTRATE

Ralph Ephraim Mishler, Menomonee Falls, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Mar. 10, 1970, Ser. No. 18,277
Int. Cl. B05c *5/02*
U.S. Cl. 118—412 **15 Claims**



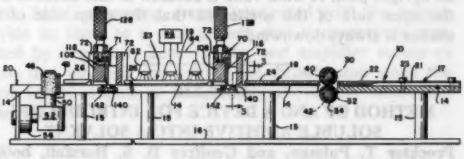
An apparatus for applying continuously to the surface of a dielectric substrate, simultaneously, a plurality of microthin stripe coatings of even thickness interconnected along adjacent edges, each coating formed from a flowable plastic material having different electrical properties so that adjacent coatings form a linear junction between them having uniform and improved electrical characteristics across the junction between the different materials.

3,645,233

APPARATUS FOR SUCCESSIVELY APPLYING A PLURALITY OF COATINGS TO A SUBSTRATE

Ralph Ephraim Mishler, Menomonee Falls, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Mar. 10, 1970, Ser. No. 18,276
Int. Cl. B05c *5/02*
U.S. Cl. 118—642 **17 Claims**



An apparatus for successively applying to the surface of a dielectric substrate, a plurality of parallel microthin coatings with the adjacent edges forming a fine edge overlap, each coating formed from a flowable viscous plastic material having dispersed therethrough particles that exhibit discrete electrical properties so that the adjacent coatings forming the thin line overlapped junction between them have uniform and improved electrical characteristics across the junction between the different plastic materials.

3,645,234

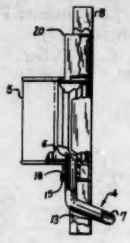
ANIMAL FEEDING DEVICE

Gary J. Schroer, Prairie Village, Kans., assignor to Schroer Manufacturing Company, Inc., Kansas City, Mo.

Filed Sept. 21, 1970, Ser. No. 73,842
Int. Cl. A01k *7/02*
U.S. Cl. 119—18 **11 Claims**

An animal feeding device for mounting on animal cages, for example, cages for primates, monkeys and the like, includes a mounting plate secured to an animal cage and having a bracket extending outwardly therefrom for removably supporting a feeding tube which has one portion extending into the animal cage and an other portion with a beveled and

sharpened end to puncture and penetrate a food container in response to operation of a container moving and holding



mechanism. A seal member engages the container and feeding tube preventing leakage.

3,645,235

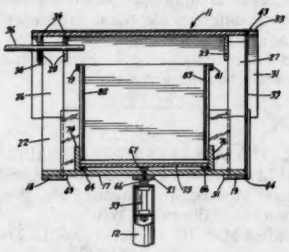
SHELTER FEEDER

John R. Suchla, 2629 2nd St. N., Minneapolis, Minn.

Filed Apr. 13, 1970, Ser. No. 27,908

Int. Cl. A01k *05/00*

U.S. Cl. 119—51 R **10 Claims**



An enclosure having one open side covering a bird-feeding hopper. A bearing assembly rotatably supports the shelter on an upright post. A wind vane is secured to and extends from the open side of the shelter so that the open side of the shelter is always downwind.

3,645,236

METHOD OF AND A DEVICE FOR INTRODUCING A SOLUBLE ADDITIVE INTO A SOLVENT

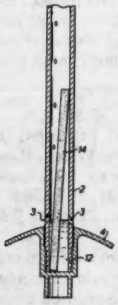
Prockter T. Pulman, and Geoffrey D. S. Horsfall, both of Rainbow Valve Co. Limited, Uthorpe Road, Stanton, Bury St. Edmunds, Suffolk, England

Filed June 11, 1970, Ser. No. 45,487

Claims priority, application Great Britain, June 12, 1969, 29,732/69

Int. Cl. A01k *7/00, 39/02*

U.S. Cl. 119—81 **6 Claims**



Soluble additive such as medicament in the form of a solid sticklike body is located in a pocket with an overflow arrangement such that the body is immersed at a substantially constant level in solvent which is supplied through the pocket to form a solution of substantially constant strength in a receptacle such as a drinking trough for livestock.

3,645,237

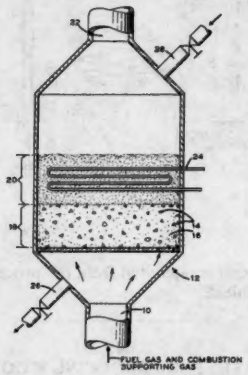
WATER HEATER HAVING FLUIDIZED BED COMBUSTION AND HEAT EXCHANGE REGION

Ram Gopal Seth, Piscataway, N.J., assignor to American Standard Inc., New York, N.Y.

Filed June 10, 1970, Ser. No. 45,084

Int. Cl. F22b *1/02*

U.S. Cl. 122—4 D **12 Claims**



Water is heated to an elevated temperature or steam is produced, by passing water through heating coils which are embedded in a fluidized bed of inert particles. The heat for the system is produced by combustion of a material such as propane, methane or the like in a lower zone of the fluidized bed. The combustion is stabilized by intermixing small particles and large particles in the lower zone. The large particles are not fluidized but are merely suspended in the upflowing fluid, and the small particles are fluidized in the interstices of the large, relatively stationary particles.

3,645,238

FLEXIBLE SEAL BETWEEN ROOF AND SIDEWALLS OF A STEAM GENERATOR FURNACE

Gerhard W. Suhs, Longmeadow, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 19, 1970, Ser. No. 81,771

Int. Cl. F22b *37/36*

U.S. Cl. 122—235 G **10 Claims**

A gastight flexible seal structure connecting the vertical tubular sidewalls with the tubular roof at their line of intersection, with the various parts thereof including: a skin casing

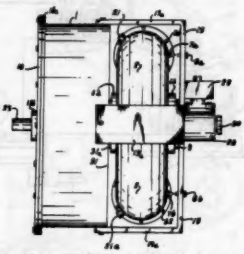
covering the upper surface of the roof tubes; a gastight vertical seal structure sealing the space between the sidewall tubes from air or gas leakage with this seal structure terminating a predetermined distance above the roof elevation; a first flexible seal plate having one edge scalloped and seal welded to the sidewall tubes and the above vertical seal structure, and having a generally upright portion freely extending along the furnace-facing side of the sidewall tubes; and a second seal plate having its upper edge seal welded to the upright portion of the first seal plate and its bottom edge seal welded to the roof skin casing, and with the upper part forming an angle with the vertical and the lower part being bent outwardly from the sidewall tubes with respect to the lower part.

3,645,239

ROTARY PISTON MACHINE

Arnulfo Q. Cena, 108 Volta St., Makati, Rizal, Philippines

Filed Oct. 24, 1969, Ser. No. 869,075
Int. Cl. F02b 53/08
U.S. Cl. 123—8.07 8 Claims



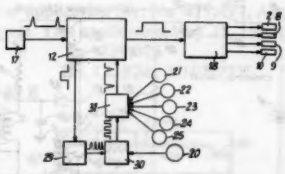
My present invention relates to rotary machines and, more particularly, to a rotary internal-combustion engine having a rotating annular cylinder block within which are housed a pair of double-faced arcuate pistons rotating relatively therewith.

3,645,240

ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE INJECTORS

Louis A. Monpetit, L'Etang-la-Vill, France, assignor to Societe des Procedes Modernes d'Injection Sopromi, Les Mureau, France

Filed Feb. 11, 1970, Ser. No. 10,347
Claims priority, application France, Feb. 26, 1969, 6904907
Int. Cl. F02d 5/00
U.S. Cl. 123—32 EA 7 Claims



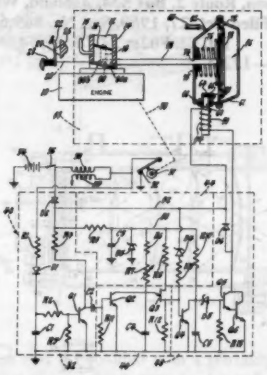
Electronically controlled injector arrangements. An arrangement for adjusting the duration of injection into the cylinders of an internal combustion engine by means of signals produced by a bistable flip-flop controlled by the rotation of the engine, said signals defining the beginning and the end of the successive injections. The adjustment of the duration of injection is provided by delay means including a relaxation oscillator, the pulses produced by which are transformed into a train of rectangular high-frequency signals the duration of which is controlled by a main parameter governing the operation of the engine. These signals are then integrated and when a predetermined amplitude is reached, as defined by other parameters governing the operation of the engine, the end-of-injection signal is generated.

3,645,241

BISTABLE THROTTLE CONTROL SYSTEM

Gerald O. Huntzinger, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 16, 1970, Ser. No. 29,111
Int. Cl. F02d 9/00
U.S. Cl. 123—102 3 Claims



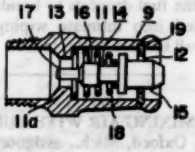
A throttle valve the complete closure of which is prevented by a throttle stop that is advanced by electrically activated vacuum means above a preset speed of an engine responsive to the setting of the throttle valve and retracted below this speed. Pulse generating means connected with the engine provide an input to a timing stage that is operatively connected by capacitor, Zener diode, and amplifier means to means that advance and retract the throttle stop when the speed of the engine is respectively above and below the preset speed.

3,645,242

CRANKCASE VENTILATION VALVE

Hideo Horiuchi, Yokohama, Japan, assignor to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan

Continuation of application Ser. No. 826,220, May 20, 1969, now abandoned. This application Mar. 31, 1971, Ser. No. 130,025
Int. Cl. F02f 9/00; F02m 25/06
U.S. Cl. 123—119 B 4 Claims



A crankcase ventilation valve located in a conduit connected between the crankcase and the intake manifold of an internal combustion engine, and including a movable rod located in the housing of said valve. The movable rod has a large diameter first metering portion operating in conjunction at all times with a first orifice for metering the flow of

gas through the valve and forming a differential pressure applying area of the rod. In addition, the rod has a second smaller diameter metering portion thereon positioned longitudinally downstream of said first metering portion and operating in conjunction with a second smaller diameter orifice. The second smaller diameter metering portion and orifice act to further reduce the flow rate of gasses through the crankcase ventilation valve at increased negative pressures above a predetermined point, nullify the flow restriction effect of the first orifice and form a smaller differential pressure applying area.

3,645,243

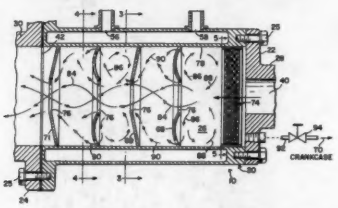
FUEL MIXING AND VAPORIZING DEVICE FOR INTERNAL COMBUSTION ENGINES

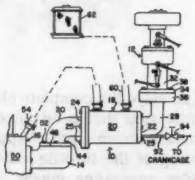
Nils C. Ohlsson, Route 2, Box 534, Ashland, Wis.

Filed Oct. 27, 1969, Ser. No. 869,627

Int. Cl. F02m *31/10, 29/04*

U.S. Cl. 123—122 A **29 Claims**





A fuel mixing and vaporizing device adapted to be connected between the carburetor and the intake manifold of an internal combustion engine and comprising a series of baffle plates spaced longitudinally apart in a heating and mixing chamber which is defined by a heat exchange jacket of tubular configuration. Fine mesh screens are disposed in the heating and mixing chamber between the baffles and the inlet end of the chamber. Hot water from the engine's coolant system is circulated through the jacket to preheat the fuel-air mixture which is drawn through the chamber by the suction created by operation of the engine. The screens provide a mechanical obstruction to create turbulence in the mixture entering the chamber, thereby mixing the fuel and air constituents. The baffle plates are configured and arranged to create more turbulence for mixing the fuel with the air, thereby causing the fuel droplets to break up into a fine mist which is deflected into intimate wiping contact with the heated interior wall surface of the jacket.

3,645,244

SYSTEM FOR MIXING AIR WITH FUEL TANK VAPOR

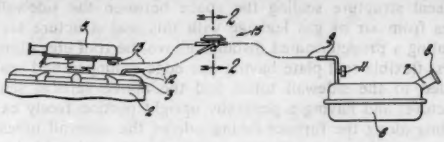
Robert Seyfarth, Oxford, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of application Ser. No. 2,050, Jan. 12, 1970, now abandoned. This application Mar. 31, 1971, Ser. No. 129,938

Int. Cl. F02d *19/00*

U.S. Cl. 123—136 **10 Claims**

A system for mixing air with fuel tank vapor in which fuel vapor stored in a fuel tank is used to open a diaphragm operated mixing valve to meter fuel vapor and air into the intake manifold of an internal combustion engine.



3,645,245

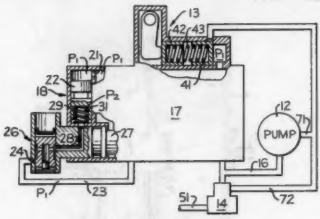
SPEED LIMITER FOR HYDRAULIC GOVERNOR

James T. Hammond, Tremond, and John H. Parks, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 4, 1970, Ser. No. 69,705

Int. Cl. F02d *1/12*

U.S. Cl. 123—140 FG **5 Claims**



An engine speed limiting system including a hydraulic governor responsive to a reference fluid pressure in a main conduit for providing a variable rate of fuel transfer, a pump for delivering fluid into the main conduit, a regulating valve for selectively adjusting the reference fluid pressure and a limiting valve which is biased by variable fluid pressure for another source to establish a maximum value for the reference fluid pressure.

3,645,246

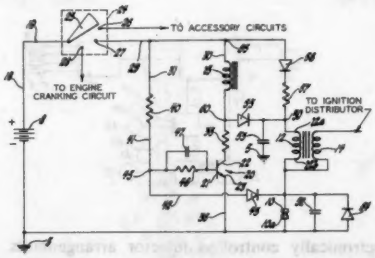
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM HAVING INCREASED IGNITION SPARK ENERGY

Robert E. Campbell, and Gerald O. Huntzinger, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 22, 1970, Ser. No. 39,664

Int. Cl. F02p *3/06*

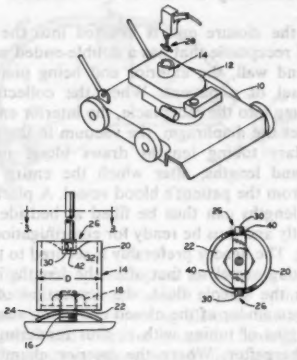
U.S. Cl. 123—148 E **4 Claims**



An improved internal combustion engine ignition system having increased ignition spark energy. The series combination of an inductor and the current carrying electrodes of a transistor is connected in parallel with the series combination of the ignition coil primary winding and the ignition coil pri-

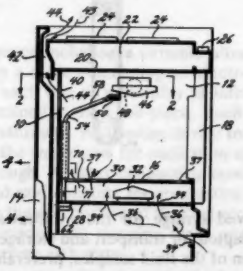
mary winding switch across the battery. The transistor conducts through the current carrying electrodes with each opening of the ignition coil primary winding switch to complete an energizing circuit for the inductor and extinguishes with each closing of the ignition coil primary winding switch to interrupt the energizing circuit for the inductor. The potential induced in the inductor by the collapsing magnetic field thereof is applied across the ignition coil primary winding in series aiding relationship with the potential of the battery to increase the rate of rise of the ignition coil primary winding current.

3,645,247
MOTOR STARTING APPARATUS
Pete R. D'Ambrosio, 3126 West 46th St., Cleveland, Ohio
Filed June 12, 1970, Ser. No. 45,788
Int. Cl. F02n *11/14, 11/12, 15/10*
U.S. Cl. 123—179 SE **1 Claim**



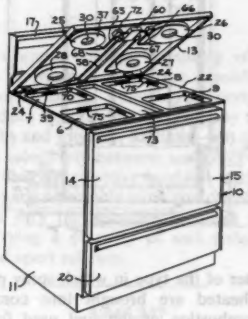
An apparatus for starting internal combustion engines of the type used on lawnmowers, snowblowers, and the like. The apparatus includes a cup-shaped driven member of tubular configuration adapted to be connected to the drive shaft of an engine. The upper edge of the driven member has diametrically opposed, inwardly extending recesses. A drive member having a shank for receipt in a power-driven chuck and a transversely extending end portion for engaging the recesses. The driven and driving members are arranged to provide smooth engagement and disengagement with no "kick-back."

3,645,248
CONSTANT BURNING PILOT FOR DOUBLE BURNER OVEN
Wayne T. Kemp, Kutztown, Pa., assignor to Caloric Corporation
Continuation of application Ser. No. 477,477, Aug. 5, 1965, now abandoned. This application May 27, 1968, Ser. No. 739,976
Int. Cl. F24c *3/10*
U.S. Cl. 126—39 E **5 Claims**



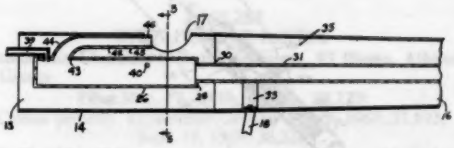
Means for preventing extinguishment of a pilot burner in the oven of a gas burning stove either by envelopment with products of combustion or due to concussion which results when the oven door is slammed shut.

3,645,249
GAS COOKTOP WITH INTEGRAL BURNERS
Wayne L. Henderson, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company
Filed May 5, 1970, Ser. No. 34,801
Int. Cl. F24c *3/00*
U.S. Cl. 126—39 H **4 Claims**



A gas cooktop that is provided with a plurality of integral burners such that the cooktop may be hinged adjacent its rear edge to an underlying support housing so that the cooktop may be raised in the front for cleaning and servicing therebeneath. Each integral burner has a burner opening in the cooktop and an annular pan sealed about its inner and outer peripheries to the underside of the cooktop to form a burner manifold. Downwardly inclined radial gas ports are formed in the manifold to create a flame pattern within the burner opening. A separate source of secondary air is furnished beneath each burner and the air comes from all sides to flow through the burner opening by using a partitioned cover plate beneath the cooktop. A utensil-supporting grid is centered over each burner and it has a central annular flame spreader and an outer flame diverter to keep the cooktop from being overheated in the area surrounding each burner.

3,645,250
ORCHARD-HEATING UNIT
Donald E. Porter, Route 2, Box 213-A, and Ray A. Paulus, Route 1, Box 9, both of Prosser, Wash.
Filed June 8, 1970, Ser. No. 43,994
Int. Cl. A01g *13/06;* **F23c** *3/02*
U.S. Cl. 126—59.5 **3 Claims**



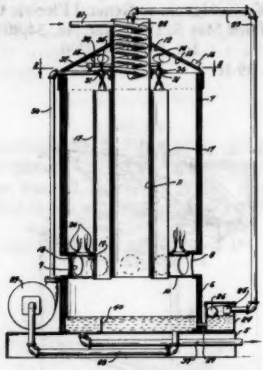
An orchard-heating unit is described having an outer tubular casing and a pulse-type jet combustion chamber and accompanying exhaust tube coaxially mounted therein. The casing has a side opening with an air intake line extending from the side opening to the combustion chamber.

3,645,251

WATER HEATER

Robert B. Black, 2925 Denver St., Corpus Christi, Tex.

Filed Mar. 31, 1970, Ser. No. 24,206
Int. Cl. F24h 1/10
U.S. Cl. 126—359 14 Claims



A water heater of the type in which spray particles of the water to be heated are brought into contact with the products of combustion of the fuel used for heating the water, the heater including a burner, a stack, and means providing a flow path having runs extended in different directions from the burner to the stack, and an accumulating chamber for heated water below the stack. Means are also provided for circulating water from the accumulating chamber to water spray nozzles delivering water spray into a run of the flow path extended downwardly into the water accumulating chamber, for preheating the feed water by bringing it into heat exchange relation with the products of combustion, and for passing the water through a water jacket for the combustion chamber after the water has been heated by contact with the products of combustion.

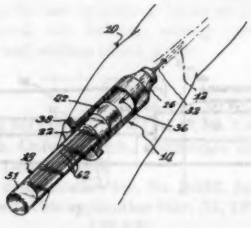
A water spraying nozzle is also provided having a chamber with two water inlets, one arranged axially of the water spray delivered from the nozzle and the other arranged tangentially, with control means for regulating the portion of water introduced axially and tangentially.

3,645,252

APPARATUS FOR SAMPLING BLOOD OR THE LIKE FLUID

Saul R. Gilford, Oberlin, Ohio, assignor to Gilford Instrument Laboratories Inc., Oberlin, Ohio

Continuation-in-part of application Ser. No. 741,024, June 28, 1968, now abandoned. This application Dec. 5, 1968, Ser. No. 781,386
Int. Cl. A61b 5/14
U.S. Cl. 128—2 F 32 Claims



An elongate vessel having a blind end and an open end has a plurality of lengths of capillary tubing mounted on its interior in a removable assembly, the lengths being parallel to one another and axially arranged relative to the vessel. One end of each length of tubing is closed off and the other end is open. All of the lengths of tubing are mounted in a header that is disposed adjacent the open end of the vessel, the open ends of the lengths of tubing being in communication with the chamber formed in the vessel between the header and the open end, the open end being provided with a closure that includes a diaphragm capable of being pierced by a cannula without leakage. On assembly and closing of the vessel, at least the end chamber is evacuated thereby also evacuating the interior of each of the lengths of capillary tubing. The interior chamber may also be evacuated to prolong storage life, in which case there is a bleed passageway between the two chambers which preferably is capable of being blocked when the apparatus is ready for use. At that time or subsequently the interior chamber may be connected to atmosphere to enable facile withdrawal of the header with the filled lengths of tubing. A valve arrangement provides for the connecting of the chambers, their being disconnected one from the other and the connecting of the interior chamber with the atmosphere.

In use, the closure end is inserted into the socket of a cylindrical receptacle that has a double-ended needle cannula in its end wall, the exterior end being pierced into the blood vessel of a patient. When the collecting vessel is pushed home into the receptacle, the interior end of the cannula pierces the diaphragm, the vacuum in the end chamber and capillary tubing lengths draws blood into said end chamber and lengths, after which the entire apparatus is removed from the patient's blood vessel. A plurality of capillary tube lengths can thus be filled at bedside quickly and conveniently and thus be ready for centrifugation and further processing. The header preferably is secured to the closure of the collecting vessel so that after the lengths of tubing are filled with the sample fluid, the separation of the closure from the remainder of the closed collecting vessel carries all of the lengths of tubing with it, thus rendering them easily handled thereafter. Where the interior chamber has been connected to atmosphere, the closure is easily removed with a minimum of effort.

3,645,253

INSTRUMENT FOR THE WITHDRAWAL OF BODY FLUIDS

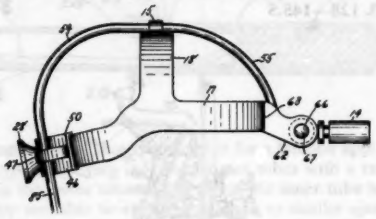
Bastiaan Cornelis Goverde; Rijkent Hendrik Drost, both of Oss, and Bernardus Louwerens, Berghem, all of Netherlands, assignors to Organon Inc., West Orange, N.J.

Filed Nov. 4, 1969, Ser. No. 873,903
Claims priority, application Netherlands, Nov. 12, 1968, 6816121
Int. Cl. A61b 10/00
U.S. Cl. 128—2 F 7 Claims

An improved syringe for the withdrawal of body fluids, especially adapted for transport and storage as well as for the centrifugation of the fluid samples, preferably blood samples, comprises a tube having a hermetically end, the closure of

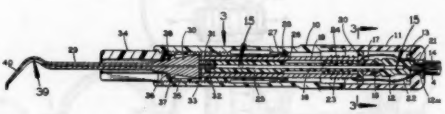
which, being a stopper or cap, is entirely or partly made of resilient material, through which a needle, preferably of stainless steel, extends, which ends in or is tightly pressured against a piston mounted in the tube. Said piston is preferably provided with a concave at the side where the needle ends. Thus a hermetically sealed compartment is obtained through which the needle extends. Said Compartment is suitable for aseptic storage of auxiliaries such as anticoagulants and/or antiseptics.

3,645,254
SURGICAL LIGHT
Charles Burton, 601 North Broadway, Baltimore, Md.
Filed Apr. 17, 1970, Ser. No. 29,412
Int. Cl. A61b *1/06*
U.S. Cl. 128—23 **1 Claim**



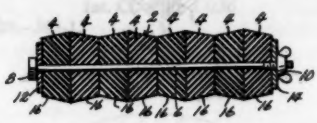
A surgical light of a type adapted to be worn on the head of a user, including a harness element, a fiber optic light carrier element, and a light projecting element carried by said harness element, said harness element having frictional retaining means thereon engaging said light carrier element at a plurality of points therealong, said light projecting element forming a socket, a free end of said light carrier element being maintained in tensionless condition within said socket in the absence of other retaining means, whereby said light carrier element may be conveniently detached for use with other equipment, or for purposes of sterilization.

3,645,255
ULTRASONIC TOOTH-CLEANING APPARATUS
Seymour Robinson, Miami, Fla., assignor to Hydrosonic Corporation, Miami, Fla.
Filed Feb. 2, 1970, Ser. No. 7,607
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 A **4 Claims**



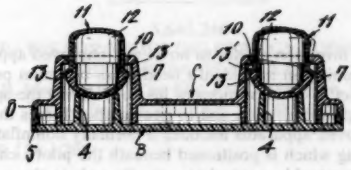
A dental hand-piece including a ceramic ultrasonic transducer energized by a cable connecting an electronic generator for oscillating each one of a plurality of interchangeable treatment tools retained in the hand-piece. Each of the tools having a bore therethrough. A coupling device for engaging a selected tool with the transducer for oscillation and conducting water therethrough. A water conducting conduit through said transducer and said coupling for conducting pressurized water to flow from the end portion of the tool secured in said hand-piece for ultrasonically cleaning teeth and massaging gums and flushing same with water.

3,645,256
MASSAGE-EXERCISER DEVICE
Robert W. Morrison, 801 North River Road, Independence, Mo.
Filed Mar. 25, 1970, Ser. No. 22,488
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **9 Claims**



A massage-exerciser device consisting of a number of resilient discs of frustoconical shape assembled in stacked coaxial relation to form a roller having peripheral ribs and grooves, said discs being reversible whereby to vary the pattern of said ribs and grooves, hard and soft spacers adapted to be inserted selectively between said discs whereby to increase or decrease the effective hardness of the roller, and a clamp for applying a variable axial compressive load to said roller, also to vary the effective hardness thereof, and a frame for carrying a plurality of said rollers rotatably in parallel, spaced-apart relation.

3,645,257
MASSAGE TOOL
Takeo Nakayama, 11-19, 5-chome, Minami-Senji, Arakawa-ku, Tokyo, Japan
Filed Aug. 24, 1970, Ser. No. 66,308
Claims priority, application Japan, Apr. 28, 1970, 45-41641
Int. Cl. A61h *7/00*
U.S. Cl. 128—60 **8 Claims**

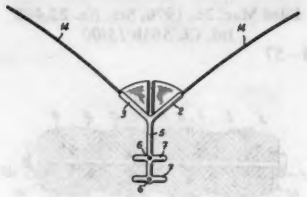


A message tool is constructed entirely of molded plastic so as to be more economical, lighter in weight and more easily used than prior art devices. The construction provides a simple two-piece plastic housing which holds pivotal message members of plastic which protrude from the housing for bodily contact with a patient, the housing being manipulatable to effect a massaging action of the message members. The construction provides concentric molded collars and skirts on the housing members which effect support sockets for the message members and rigidifying means for the housing.

3,645,258
INTRAUTERINE DEVICE
Charis Aka Charilaos George Massouras, 93 Ilissou, Athens, Greece
Filed Mar. 17, 1970, Ser. No. 20,229
Claims priority, application Greece, Apr. 8, 1969, 37,193; Sept. 18, 1969, 38,223
U.S. Cl. 128—130 **20 Claims**

The invention concerns a gynaecologycal device for insertion in a woman's womb, i.e., an intrauterine device. This device includes a Y-shaped flexible support means, the branches of which are each provided with a fanlike, inwardly

extending membrane covering at least part of the space between the two branches. This intrauterine device has the



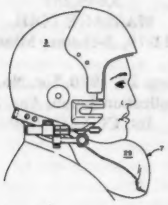
advantage of enabling its part which penetrates into the uterus to unfold after introduction therein so as to cover up practically the whole internal wall of the uterus.

3,645,259

CREWMAN'S HEAD POSITIONING AND RESTRAINING DEVICE

Marvin Schulman, Broomall, Pa., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 23, 1970, Ser. No. 83,378
Int. Cl. A42b *3/02*
U.S. Cl. 128—133 7 Claims



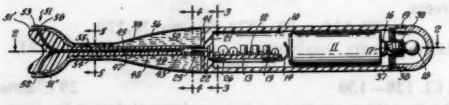
Subject invention relates to novel and improved apparatus for maintaining an individual's head in an optimum position with respect to other portions of his body during the application of high acceleration and/or deceleration forces thereon. The improved apparatus includes a normally noninflated inflatable bag which is positioned beneath the pilot's chin and which is removably secured at opposite ends to the ear lobe portions of the pilot's helmet, and means for quickly inflating the bag when a high acceleration or deceleration force occurs. The bag is designed such that in its noninflated condition, it may be folded into a compact band that is readily and comfortably attached to the chin strap of the helmet.

3,645,260

DENTAL DESENSITIZER

William R. Cinotti, Glen Ridge, N.J.; Joseph Panico, Arlington, and Robert J. Barton, Woburn, both of Mass., assignors to Health Systems, Inc., Woburn, Mass.

Filed July 17, 1970, Ser. No. 55,916
Int. Cl. A61n *35/00*
U.S. Cl. 128—172.1 9 Claims



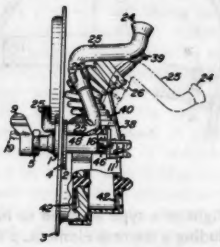
A dental desensitizer apparatus which includes a hollow dielectric housing having therein a source of electrical energy connected to a current regulating means connected to and for activating a lamp carried at one end of said housing. Said means being operative to light said lamp only when the current output of the regulating means is of a selected amperage. A translucent cover closing said housing across said lamp and an oral operating extension selectively separable from said housing attached to the other end of said housing. Said extension being of a translucent soft and flexible dielectric material and having formed therein a pair of cavities each communicating with a separate porous spongelike pad disposed on opposite sides of the tip of the extension. Electrical connection is made between each of said pads and the output of said regulating means.

3,645,261

DRINKING AND RESUSCITATION MASK

Allan L. West, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Aug. 4, 1970, Ser. No. 60,878
Int. Cl. A62b *18/00*
U.S. Cl. 128—145.5 4 Claims



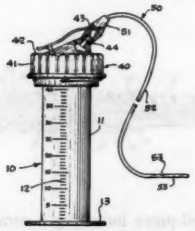
An improved protective mask having a drinking and resuscitation means and the methods of drinking and resuscitating with the mask; the improvement being a cam and a lever system for positive and quick positioning of the breathing tube and drinking mouthpieces within the mouth of the mask wearer to provide a fail-safe arrangement which obviates violation of the protective integrity of the mask.

3,645,262

VOLUMETRIC INFANT FEEDING UNIT

Robert Emmet Harrigan, Westerville, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 5, 1969, Ser. No. 874,161
Int. Cl. A61j *09/00*
U.S. Cl. 128—222 1 Claim



An infant feeding unit for the feeding of precise quantities of formula to an infant and which comprises a container calibrated for accurate measurement of liquid contents within the container and including a nipple and a retaining cap for retaining the nipple on the container. Included in the unit is a transfer cap engageable with both the calibrated container and a conventional infant feeding container, and including a projecting hub. The transfer cap is used to

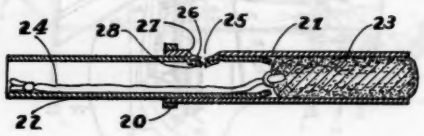
facilitate transfer of formula from the conventional container to the calibrated container, the hub being adapted for engagement with an infant feeding catheter whereby, when attached to the calibrated container, the unit can be used for feeding of an infant by the gavage method when the infant cannot be fed orally.

3,645,263

LOCKING ARRANGEMENT FOR TUBE-TYPE APPLICATORS FOR TAMPONS AND THE LIKE

John D. Bates, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 21, 1969, Ser. No. 852,032
Int. Cl. A61f *15/00*
U.S. Cl. 128—263 **9 Claims**



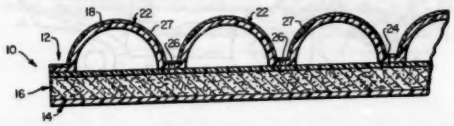
An improved locking arrangement for a tampon applicator of the type employing inner and outer tubes with a tampon seated in the outer tube and in which the inner tube is telescopically movable to eject the tampon or similar ejectable element. The improved arrangement temporarily locks together the inner and outer tubes to prevent premature separation during handling and processing. The locking arrangement is formed by punching through the wall of the outer tube, in an area where the inner and outer tubes overlap, an aperture defining at least one forward pointing, downwardly bent, triangular-shaped tab with a convex base depending from a concavely arcuate hinge line. The concavely arcuate hinge line from which the convex base the triangular-shaped tab downwardly depends, provides a stable construction which prevents the tab from losing its downward bend, due to its natural resilience until the tubes are manually pushed together by the user to eject the tampon. The aperture forming the locking arrangement may be circular and define a plurality of downwardly bent triangular segments with their convex bases and concavely arcuate hinge lines collectively forming the circumference of the aperture.

3,645,264

ABSORBENT PAD

John P. Gallagher, 1519 North Ocean Way, Palm Beach, Fla.

Filed Nov. 5, 1970, Ser. No. 87,042
Int. Cl. A61f *13/00*
U.S. Cl. 128—296 **3 Claims**



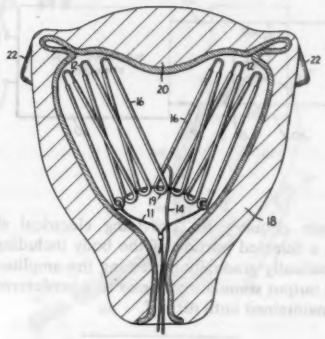
An absorbent pad comprising a plurality of layers including at least a pneumatic cellular layer, a liquid absorbent layer and a bottom liquid impervious layer, the pneumatic cellular layer comprising a pair of plastic sheets having a plurality of air cells extending between opposed surfaces thereof, portions of the opposed surfaces of the sheets being sealed to each other to form partition walls between adjacent cells and liquid permeable perforations extending through the partition walls, is provided with a fluid or elastomeric coating of a nonirritating silicone composition on the upper surface of the cellular layer to enhance patient comfort and reduce sticking of the patient's body thereto.

3,645,265

INTRAUTERINE CAUTERIZING DEVICE

Gregory Majzlin, 92 Whitman Drive, Brooklyn, N.Y.

Filed June 25, 1969, Ser. No. 836,497
Int. Cl. A61b *17/36*
U.S. Cl. 128—303.13 **2 Claims**



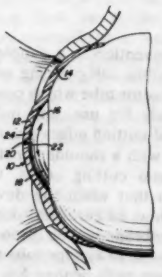
The present invention relates to a spring member particularly adapted for use in cauterizing the uterus. One potentially large application of this is in cauterization of the openings of the fallopian tubes to prevent pregnancy.

3,645,266

APPARATUS FOR REMOVING FOREIGN BODIES FROM THE CORNEA OF THE EYE

Loran B. Morgan, 127 West 21st Ave., Torrington, Wyo.

Filed Dec. 29, 1969, Ser. No. 888,526
Int. Cl. A61b *17/32*
U.S. Cl. 128—305 **4 Claims**

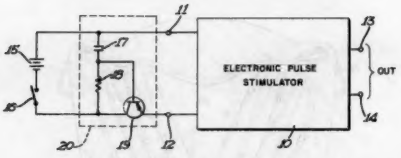


Foreign bodies are removed from the cornea of the eye by natural corneal movement relative to a special contact lens placed in contact therewith. The eye is anesthetized before the contact lens is applied. The lens is provided with one or more openings in its central portion contacting the corneal epithelium so as to form cutting edges along which the epithelium embedding the foreign bodies, is dissected.

3,645,267
MEDICAL-ELECTRONIC STIMULATOR, PARTICULARLY A CAROTID SINUS NERVE STIMULATOR WITH CONTROLLED TURN-ON AMPLITUDE RATE

Norman R. Hagfors, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 29, 1969, Ser. No. 872,150
Int. Cl. A61n 1/36
U.S. Cl. 128—421 11 Claims

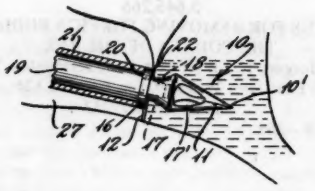


Electronic circuitry for providing electrical stimulation signals to a selected portion of the body including circuitry for automatically gradually increasing the amplitude of only the initial output stimulating signals to a predetermined level which is maintained until turnoff.

3,645,268
DISPOSABLE, PRESTERILIZED, SELF-LOCATING AND PIERCING EVACUATOR WITH EJECTOR TUBE

Dagoberto Capote, 1075 Mullins Sta. Road, Memphis, Tenn.

Filed Dec. 10, 1969, Ser. No. 883,718
Int. Cl. A61b 17/34; A61m 27/00
U.S. Cl. 128—347 3 Claims



The present invention is a simple, inexpensive and consequently disposable, self-piercing and locating combination evacuator and ejector tube which can be encased in a sheath, presterilized ready for use, and includes a spearhead-type body with spaced cutting edges diverging from a pointed top rearwardly, and with a shoulder or flange spaced beyond the rear limits of said cutting edges, with a reduced portion therebetween so that when the device is used to pierce a membrance such as an eardrum, skin or other body portion, such skin or membrane will be disposed in such reduced portion with the handle or ejector tube removed, and the device left in the incision until healing has occurred, whereupon it can be readily removed. Thus the evacuator is of a construction to have superior holding qualities, to provide minimum interference with nature's healing, and is of a composition readily recognizable as suitable for implantation in the human body.

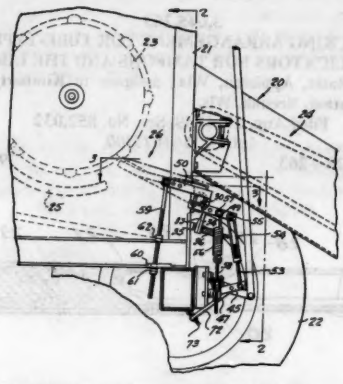
ERRATUM

For Class 130—26 see:
Patent No. 3,646,373

3,645,269
THRESHING MACHINE

Henry C. Peruski, M-19, Ubly, Mich.

Filed Apr. 7, 1970, Ser. No. 26,219
Int. Cl. A01f 12/00
U.S. Cl. 130—27 JT 8 Claims

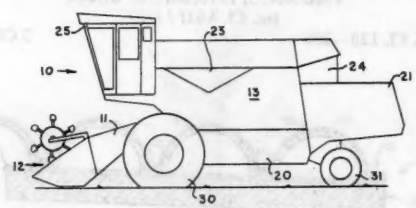


A threshing machine in which pressure vibrator fingers are positioned beneath a conventional rotatable threshing cylinder for cooperation therewith to thresh grain. The fingers are mounted so that a rock coming in contact therewith will cause the fingers to move downwardly permitting the rock to fall to a lower conveyor without damage to the threshing machine. The fingers may be restored to threshing position by the actuation of a manually controlled lever from the operator's station.

3,645,270
AXIAL FLOW THRESHING AND SEPARATING UNIT CREATING AN AIRFLOW ALONG THE GRAIN PAN

Edward William Rowland-Hill, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Continuation-in-part of application Ser. No. 790,145, Jan. 9, 1969. This application Nov. 24, 1969, Ser. No. 879,216
Int. Cl. A01f 12/20
U.S. Cl. 130—27 T 9 Claims



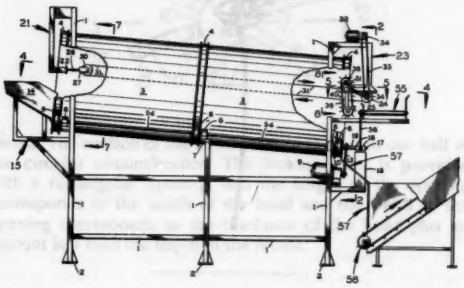
An axial-flow-type combine has threshing and separating unit or units with rotor or rotors creating an airflow through the concaves onto the grain pan to assist in the movement of the grain along the grain pan and to remove chaff and other light material from the grain. The separator rotor or rotors have control means in the form of radial discs to restrict the flow of air through the concaves.

3,645,271

MACHINE FOR CUTTING STEMS FROM LEGUME PODS

Harold R. Arve, and William T. Queen, both of 25320 S.W. 108 Ave., Goulds, Fla.

Filed Apr. 6, 1970, Ser. No. 25,652
Int. Cl. A01d *55/22*; A23n *15/00*
U.S. Cl. 130—30 R 1 Claim



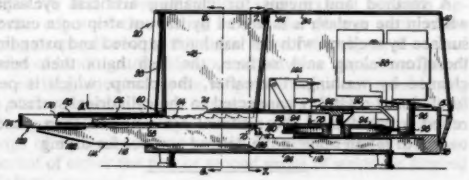
An agricultural machine for continuously cutting the stems from legumes, such as the edible immature pods of pole and bush beans. The machine includes a power-rotated tilted drum for continuously conducting field-picked stem-retained pairs of beans fed into the high end thereof. The drum has internal hooks adapted to raise and drop the bean pairs straddling a cable conveyor which conducts the beans to a power cutter in the lower end of the drum for cutting the stems from the beans and gravitating the latter onto a conveyor for transport to a packing destination.

3,645,272

AUTOMATIC CIGARETTE-MAKING MACHINE

Ray T. Jenkins, Kansas City, Kans.; Roy C. Degenfelder, Independence; Leonard Bieri, Jr., Lee's Summitt, both of Mo., and John J. Tetyak, Boca Raton, Fla., assignors to Jenkins & Ott, Inc., Kansas City, Kans.

Filed Oct. 13, 1969, Ser. No. 865,627
Int. Cl. A24c *5/02*, *5/32*, *5/42*
U.S. Cl. 131—21 R 17 Claims



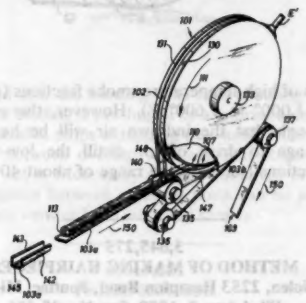
An automatic cigarette-making machine for home, office, or club use, the machine having a receptacle for receiving loose tobacco from which the cigarette is to be made, there being means carried by the machine for positioning a hollow cigarette tube with respect to the receptacle and in communication therewith; and feeder means for delivering the tobacco from the receptacle into the cigarette tube whereby to make up the finished cigarette, there being a motor coupled with the feeder means whereby the forming of individual cigarettes may be automatically accomplished upon actuation of the machine.

3,645,273

METHOD AND APPARATUS FOR MAKING FILLERS OF FIBROUS MATERIAL

Willy Richter, Hamburg-Bergedorf, Germany, assignor to Hauni Werke Korber & Co. K. G., Hamburg-Bergedorf, Germany

Continuation of application Ser. No. 594,270, Nov. 14, 1966, now abandoned, Continuation of application Ser. No. 275,164, Apr. 23, 1963, now abandoned, which is a continuation-in-part of application Ser. No. 96,533, Mar. 17, 1961, now abandoned. This application May 12, 1969, Ser. No. 826,069
Int. Cl. A24c *05/18*
U.S. Cl. 131—84 B 2 Claims



Apparatus for forming a cigarette rod or the like including a horizontally disposed relatively narrow endless belt conveyor which receives a stream of shredded tobacco and delivers the same to a suction disk conveyor rotating on a horizontal axis above the belt. The discharge end of the belt is spaced from the periphery of the disk, the space therebetween is encased in a narrow chamber forming member which contains a beating roller which drives the tobacco shreds off the belt and on to a narrow groove on the periphery of the disk. The bottom portion of the groove is foraminous so that the tobacco is held in the groove by the flow air into the interior of the disk. In a modification, the chamber is replaced by fixed parallel guides and the belt is arranged to extend around rollers which cause the belt to move away from the disk at the discharge end thereof, and then back toward and against the periphery of the disk so that the tobacco in the groove is pressed thereinto by the belt at a location downstream from the guides, after which the belt is arranged to return over rollers, to its intake end. A rotary trimmer removes excess tobacco extending radially beyond the groove at a location downstream from that where the belt pressing takes place, and a conventional stripper and belt system removes the trimmer rod stream from the disk and passes it to and through a wrapping and sealing device.

3,645,274

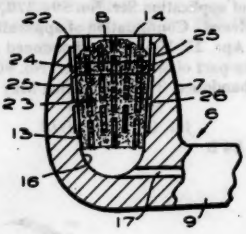
SMOKING PIPE

Herbert A. Lebert, 25 Windsor Drive, Hillsborough, Calif.

Continuation-in-part of application Ser. No. 788,449, Jan. 2, 1969, now abandoned. This application Apr. 13, 1970, Ser. No. 27,598
Int. Cl. A24f *5/00*
U.S. Cl. 131—198 R 4 Claims

A smoking pipe having interrupted channels on the interior wall of the bowl that extend downwardly from the rim to adjacent the bottom of the bowl interior, the dimensions of the channels where they open into the bowl being such that tobacco particles exceeding a predetermined size will not crowd into the channels. Moreover, the channels provide air-entrance spaces through which air may be drawn

downwardly over and around the glowing ember of the burning tobacco and into the smoke-producing zone directly below the glowing ember. The channels are large enough so that the indrawn air is much lower in temperature than if the air were drawn through the glowing ember, thus avoiding



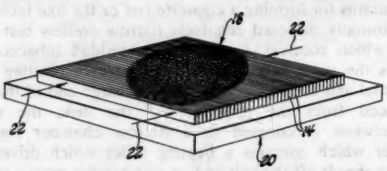
distillation of high-temperature smoke fractions (temperature of about 1,000° to 1,600° F). However, the channels are small enough that the indrawn air will be heated to the proper range to drive off or distill the low-temperature smoke fractions (temperature range of about 400° to 1,000° F.).

3,645,275

METHOD OF MAKING HAIRPIECES

Clara F. Nolen, 2253 Hampton Road, Pontiac, Mich.

Filed Apr. 3, 1970, Ser. No. 25,426
Int. Cl. N45g *3/00*
U.S. Cl. 132—5 **6 Claims**



An improved method of making a hairpiece of the type worn to cover a bald spot or the like on a human head. The method includes the obtaining of the proper pattern from the wearer and the preparation of a form on which the artificial hair is laid to the shape of the bald spot to be covered. The hair is laid in a retaining and transfer means, filling the desired pattern and following which the hair and the means are transferred to a frame for manufacture of the hairpiece base. The inner ends of the hairs, which extend through the retaining and transfer means, are trimmed to a desired and relatively short length. A plurality of thin coats of a thermoplastic material are sprayed across the inner ends of the hairs to create a subbase of a depth of about one-third the length of the inner ends of the hairs. After setting for a period of time, a coating of an epoxy resin adhesive is spread over the subbase and the inner ends of the hairs to a depth of approximately another one-third of the length of exposed inner ends of the hairs. Yet another plurality of thin coats of thermoplastic material are sprayed over the layer of epoxy resin adhesive to the remaining depth of the inner ends of the hairs, which coats are allowed to set for a period of time. The hairs and base are then removed from the transfer frame and mounted on the previously marked location on the head form. The hairs are shaped to the desired lay and suitably held in place. The head form and hairpiece are then placed under heat for a period of time to cure the materials and conform the base to the head form. Upon curing and cooling, the hairpiece may be mounted on the wearer and the hair trimmed and set for compatibility with the remaining natural hair.

3,645,276

METHOD OF MANUFACTURING WIGS AND RESULTING PRODUCTS

Chaihyung Cho, Seoul, South Korea, assignor to Ideal Wig Company, Inc., New York, N.Y.

Filed Apr. 13, 1971, Ser. No. 133,539
Int. Cl. A41g *3/00*
U.S. Cl. 132—5 **3 Claims**

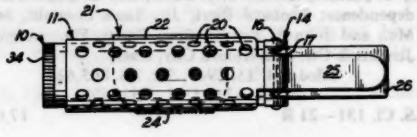
To avoid stressing synthetic fibers after they are incorporated into a wig, the fibers are thermally treated before incorporation into the wig and are then tied by a special knot to the wig cap in such a manner that the major portion of each fiber is not passed through the knot nor otherwise subjected to any stress which might harmfully alter the characteristics thereof.

3,645,277

APPARATUS FOR CLEANING ARTIFICIAL EYELASHES AND METHOD

Kathleen McCarthy, 15581 Crescentwood, East Detroit, Mich.

Filed Jan. 5, 1970, Ser. No. 688
Int. Cl. A45d *20/00*
U.S. Cl. 132—33 G **6 Claims**



A method and means for cleaning artificial eyelashes wherein the eyelash is mounted by its root strip on a curved surface by a clamp with the lash hairs exposed and extending therefrom along said surface, the lash hairs then being cleaned by washing. Thereafter, the clamp, which is perforated and rotatably connected to the cylindrical surface, is raised, rotated over the artificial eyelash, and then closed over it to retain same in the desired contour for drying.

3,645,278

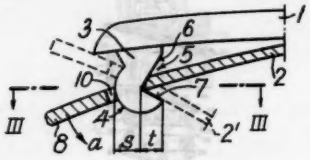
HAIR SECURING MEANS, PARTICULARLY A HAIR-CLASP OR BARRETTE, OR A HAIR-COMB WITH SUCH SECURING MEANS

Anton Abraham, Vienna, Austria, assignor to Wiener Kammfabrik Anton Abraham Komm. Ges.

Filed May 11, 1970, Ser. No. 36,361
Claims priority, application Austria, May 23, 1969, A 4928/69
Int. Cl. A45d *8/24*
U.S. Cl. 132—48 **9 Claims**

A hair securing means, such as a hair-clasp or barrette, or a hair-comb, which comprise a pivotal resilient locking lever, and a locking pin provided with a panlike recess having two

surfaces which are inclined at an angle to each other. The locking lever cooperates with the locking pin by engaging the panlike recess. The locking pin has a head in the shape of the surface of the circumference of a circular cylinder. The longitudinal axis of the latter is the apex line of the panlike



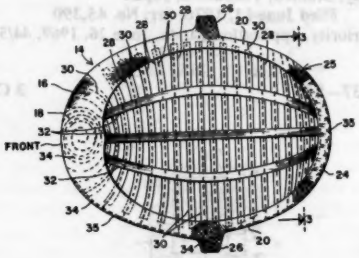
recess. The surface of the latter extends at least to one half of the circular circumference. The locking lever is provided with a rectangular opening, and the length of the opening corresponds to the width of the head and the width of the opening corresponds to the thickness of the head plus an amount less than the depth of the recess.

3,645,279

WIG CONSTRUCTION EMPLOYING A BASE OF ELASTIC AND INELASTIC STRIPS

Julius Imre, New York, N.Y., assignor to Imrelon, Inc., New York, N.Y.

Filed May 19, 1970, Ser. No. 38,828
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **8 Claims**



A wig base is constructed of C-shaped netting with an elastic strip joining the open tips of the netting to form an elipse with the elastic strip at one end of the major axis of the elipse. A first series of binding strips extend between opposite edges of the netting in parallel planes, each plane being perpendicular to the major axis of the elipse. A second series of binding strips also extend between opposite edges of the netting, intersecting the strips of the first series and lying in planes passing through the major axis of the elipse. Wefts of aligned strands of hair are sewn to the netting and the strips of the base to form a wig. Selected strips or portions thereof of either the first or second series of strips are formed of elastic material.

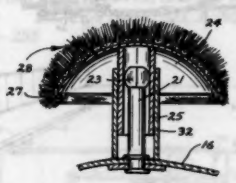
3,645,280

WIG STRUCTURE

Gary P. Cutler, and Suzanne M. Streed, 140 35 Cherry Ave. Flushing, Queens, N.Y., assignors to Gary P. Cutler and Suzanne M. Streed, part interest to each

Filed June 3, 1970, Ser. No. 42,930
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **3 Claims**

A wig structure is built up from a light, porous, relatively close fitting cap of netted material, the outer edge portion of which terminates in a binding which is flexible enough to conform to all head sizes. Flat metallic strips are attached at their ends by snaps into this binding. These strips comprise a grid network. They are of a length to define a head-shaped envelope spaced from the cap and the head of the wearer. A short post extends outwardly from each intersection of this grid network and is topped by a ball. A plate having a socket is removably supported on each ball. Miniature stretch wig sections are removably mounted over each of the plates. Hair



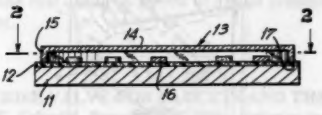
is also sewed into the binding. The hair covering the plates and from the binding is preshaped to comprise a desired coiffure. The metallic strips extending outwardly from each post of the grid network overlap with adjacent strips and each overlapping set is frictionally slidably mounted in a clip, so that the distance between adjacent posts can be adjusted to accommodate various head sizes and shapes.

3,645,281

PARTS HOLDER

David Seidler, 69-10 108th St., Forest Hills, N.Y.

Continuation-in-part of application Ser. No. 689,101, Dec. 8, 1967, now Patent No. 3,516,423. This application Apr. 3, 1970, Ser. No. 25,493
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **7 Claims**



A parts holder which has a base or support element coated with a washable adhesive so that various parts can be adhered to the adhesive surface to store the parts, secure the parts during shipment or transfer between location, or to hold the parts so they may be worked on. The adhesive surface is renewable by being washable so that it may be continually reused, even if it becomes contaminated with foreign matter.

3,645,282

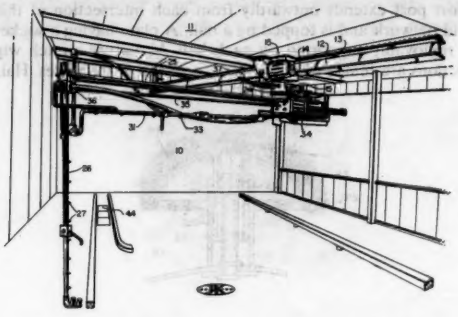
SONIC CARWASH SYSTEM AND APPARATUS

George K. Kurronen, Colorado Springs, Colo., assignor to Sonar International, Inc., Colorado Springs, Colo.

Filed July 22, 1970, Ser. No. 57,111
Int. Cl. B60s *3/04*
U.S. Cl. 134—45 **7 Claims**

The present disclosure is directed to a carwash system in which a boom is installed centrally on the ceiling of a vehicle wash bay and a tractor unit moves a carrier back and forth on the boom. The carrier supports a vertical and horizontal wash means each of which may be moved independently toward or away from the carrier to compensate for varying sizes of vehicles. The carrier has a swivel mounting between itself and the tractor for rotating the carrier in a horizontal plane. The vertical and horizontal wash means each have sonic transducers for establishing a sonar beam between the two means which will be broken by the presence and made

by the absence of a vehicle in the wash bay beneath the boom. The sonic beam controls relay circuits for sequentially



energizing and driving the tractor unit and the swivel drive on the carrier to move the wash means about the vehicle.

3,645,283

APPARATUS FOR CLEANING BEDPANS

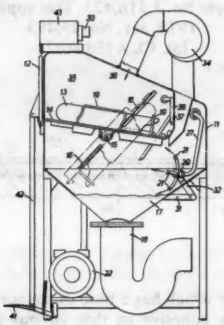
Raymond John Naismith Cassells, Portsmouth, England, assignor to Castan Limited, Portsmouth, England

Filed Oct. 6, 1969, Ser. No. 864,101

Claims priority, application Great Britain, Oct. 7, 1968, 47,427/68

Int. Cl. B08b *3/02, 9/08*

U.S. Cl. 134—58 DL **3 Claims**



This invention is an automatic cleaning unit for emptying, cleaning and sterilizing bedpans in hospitals. The nurse puts the full bedpan straight into the cabinet and an automatic cleaning cycle is initiated by the closing of the door, which first turns the pan over so that the contents falls into a collecting chamber from which it runs to sewage. Then cold water is sprayed on to the surfaces of the pan and it is turned upright and sterilizing fluid is directed at its surfaces for sterilizing it and drying it.

3,645,284

CONTACT LENS HOLDING DEVICE

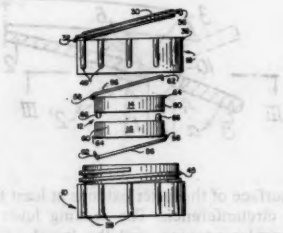
Joseph Z. Krezanoski, and John C. Petricciani, both of Los Altos, Calif., assignors to Flow Pharmaceuticals, Inc., Mountain View, Calif.

Continuation-in-part of application Ser. No. 748,277, July 29, 1968, now Patent No. 3,519,005, dated July 7, 1970. This application Feb. 20, 1970, Ser. No. 12,921

Int. Cl. B08b *11/02*

U.S. Cl. 134—166 R **9 Claims**

A device for holding a pair of contact lenses comprises means, including a pair of substantially identically shaped elements, forming a pair of axially aligned lenses holding compartments, each of the elements including a base provided with openings to permit fluid flow through both of the lenses holding compartments, a displaceable cover for each compartment to releasably confine the lenses in the compartments, each cover having perforations to permit fluid to flow into and from the lenses holding compartments, and coupling



means for axially aligning the identically shaped elements with the bases of the elements in abutting relationship to permit fluid to flow into and through both of the lenses holding compartments. The device conveniently and safely holds the lenses during cleaning under running tapwater or during immersion in a lens treating solution.

3,645,285

FLUID PRESSURE GOVERNOR VALVE

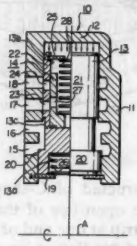
Toshio Miyazaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed June 11, 1970, Ser. No. 45,390

Claims priority, application Japan, June 26, 1969, 44/50146; 44/50147

Int. Cl. G05d *13/38*

U.S. Cl. 137—54 **3 Claims**



A fluid pressure governor valve assembly which essentially comprises a unitary governor body and a primary and secondary spring-loaded valve elements slidable received in the governor body, wherein a pressure delivered from a fluid pressure source is regulated by the primary and secondary valve elements which are arranged to move within the body toward and away from a shaft supporting the body under the combined effort of control fluid pressure, the action of the spring and the centrifugal force acting thereon.

3,645,286

SAFETY VALVE FOR LIQUID PRESSURE CYLINDERS

John Le Roy Follett, Richmond Ave., Fair Haven, N.Y.

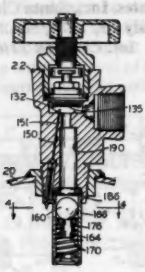
Filed May 29, 1969, Ser. No. 828,982

Int. Cl. F16k *17/28*

U.S. Cl. 137—68 **9 Claims**

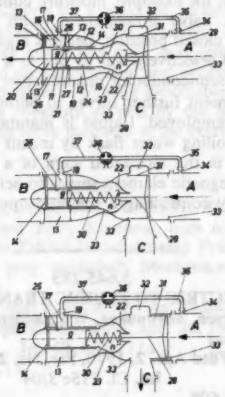
Valve for use with liquid pressure gas cylinders comprising a valve body having a shank threaded into the cylinder, and having a central bore leading to a valve seat, and a manually actuated valve movable into sealing engagement with the seat, a safety valve located on the inner end of the shank and

connecting with the bore, the safety valve being adapted to seal the bore against outflow of gas at an abnormal rate, and



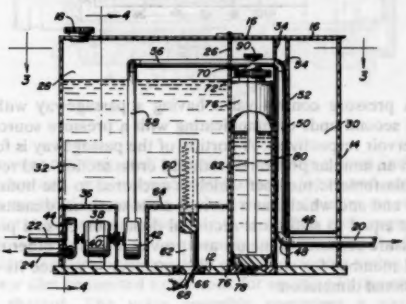
means responsive to final closing movement of the valve member for opening the safety valve seal.

3,645,287
TWO-WAY VALVE
Horst Schutze, Bremen, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany
Filed Sept. 17, 1970, Ser. No. 73,020
Claims priority, application Germany, Sept. 17, 1969, P 19 47 017.8
Int. Cl. F16k *37/00*
U.S. Cl. 137—219 **10 Claims**



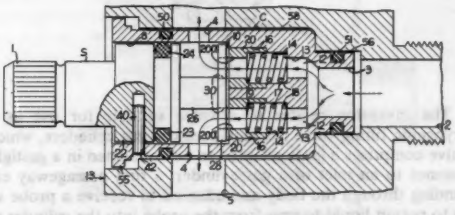
An insert assembly is mounted in a valve housing defining one incoming and two outgoing flow paths to further define the cross-sectional area of one outgoing flow path between its periphery and the inner surface of the housing. The insert assembly is made up of a hollow cylinder, a first and hollow piston arranged in the cylinder for movement with respect thereto, a second piston arranged in the hollow piston for movement with respect thereto, a third and blocking piston rigidly connected to the hollow piston for movement therewith for varying the cross-sectional area of the outgoing flow path further defined by the insert assembly, a slide valve arranged to selectively block the other of the outgoing flow paths, and a piston rod passing through the blocking piston for movement relative thereto and rigidly connecting the second piston to the valve slide so that the valve slide moves with the second piston. A control valve is operatively connected to the insert assembly to selectively move (1) the hollow piston and, thus, the blocking piston for opening and closing off the outgoing flow path associated with the blocking piston, and (2) the second piston and, thus, the valve slide for opening and closing off the other outgoing flow path. Means may be provided for closing off both flow paths simultaneously.

3,645,288
SUPPLY UNIT FOR ORAL CLEANER
Thomas C. Dawkins, 132 West Main, Anadarko, Okla.
Filed Mar. 12, 1970, Ser. No. 18,905
Int. Cl. F16k *51/00, 27/00*
U.S. Cl. 137—255 **10 Claims**



A cleanser fluid is mixed with water pressurized by a motor operated pump inducing flow of the water from a reservoir past an adjustable outlet restriction at one end of a pickup tube extending into said cleanser fluid. The water is heated within the reservoir to a temperature suitable for introduction into the oral cavity by means of a fluid pressure operated implement.

3,645,289
NONRISE VALVE FOR FAUCETS AND THE LIKE
William C. Schmitt, Brown Deer, Wis., assignor to Milwaukee Faucets, Inc., Milwaukee, Wis.
Filed Sept. 8, 1970, Ser. No. 70,096
Int. Cl. F16k *3/10*
U.S. Cl. 137—454.2 **3 Claims**



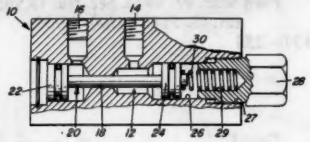
A valve for a water faucet or the like of the type which when actuated does not have a part that rises, and which valve includes a rotary sealing plate against which spring-loaded seals cooperate to seal the valve when the plate is turned to the "off" position. The valve includes a cartridge which has a stem formed as one piece along with the rotary valve and which also has a sleeve in which the stem rotates, the sleeve also being formed as one piece and providing a seat for the spring-loaded inlet seals.

3,645,290

FLUID CONTROL DEVICE

Raymond Clark, Pewaukee, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Dec. 29, 1969, Ser. No. 888,669
Int. Cl. F16k *17/06*
U.S. Cl. 137—494 5 Claims



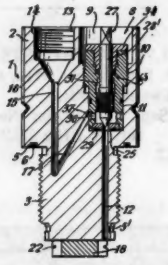
A pressure control valve having a passageway with first and second ends communicating with a pressure source and reservoir respectively. A portion of the passageway is formed with an annular portion of reduced cross section and receives an elastomeric member which is anchored to the housing at one end and which has a normal cross-sectional dimension at least equal to said cross-sectional dimension of said portion. Pressure-responsive means are provided on the other end of said member for stretching said member is reduce its cross-sectional dimension.

3,645,291

CRYOGENIC FILLING VALVE

Peter E. Finney, Knotty Green, Beaconsfield, England, assignor to Nitrochill Limited, Wembley, England

Filed May 2, 1969, Ser. No. 821,338
Claims priority, application Great Britain, May 6, 1968, 21,399/68; 21,400/68
Int. Cl. B67d *3/00*
U.S. Cl. 137—588 5 Claims



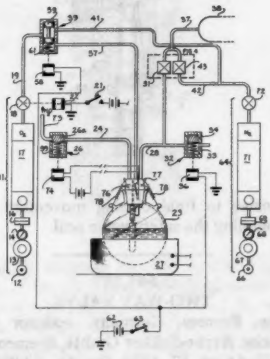
The invention relates to a valve suitable for use as a cryogenic filling valve for high-pressure gas cylinders, which valve comprises a body adapted to be connected in a gastight manner to an inlet of a gas cylinder; a first passageway extending through the body and adapted to receive a probe so as to permit liquid to pass from the probe into the cylinder to which the body is connected; first valve means for opening and closing said first passageway; a second passageway extending through the body for permitting gas to be drawn off from the cylinder; and second valve means for controlling the rate at which gas passes through the second passageway. The valve enables liquefied gas to be charged to the gas cylinder and also serves to control the delivery from the cylinder of gas produced by evaporation of the liquefied gas so charged. In a preferred embodiment, an inner vessel is provided in the gas cylinder to receive the liquefied gas charged thereto and to allow evaporated gas to pass into the remainder of the cylinder.

3,645,292

GAS SUPPLY SYSTEM

Henry L. Schoger, Sunnyvale, Calif., assignor to H. L. Schoger & Associates, Inc., Santa Clara, Calif.

Filed July 23, 1970, Ser. No. 57,482
Int. Cl. F16k *11/00*
U.S. Cl. 137—599.1 8 Claims



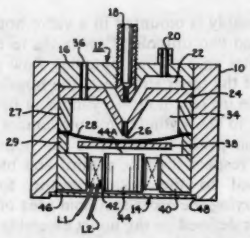
An improved gas supply system for supplying nitrogen and/or oxygen or other gases to semiconductor doping systems via liquid, such as water, boiling in a flask in a manner whereby the supply of gas remains consistent as to its characteristics, for example, moisture content, purity, etc. A double check valve arrangement, with one check valve weighted to a closed position, permits a gas, such as oxygen, to be supplied selectively wet or dry to a doping furnace as employed in semiconductor manufacture. The dual check valve arrangement further serves to permit a second source of gas to be employed. Liquid is maintained at a constant level in the boiling water flask by means of a magnetic element carried in the elongated stem of a float riding in the water. The magnetic element serves to activate a reed switch for electrically controlling a solenoid operated water supply valve.

3,645,293

ELECTRIC TO FLUIDIC TRANSDUCER

Niels E. Pedersen, Milwaukee, Wis., assignor to Johnson Service Company

Filed Apr. 2, 1970, Ser. No. 25,154
Int. Cl. F15c *3/04*
U.S. Cl. 137—608 6 Claims



The output of a fluidic amplifier is controlled by movement of a diaphragm with respect to the amplifier control nozzle. A permanent magnet magnetically coacts with a magnetizable portion of the diaphragm to provide a predetermined flux density to such portion. An electromagnetic coil is also positioned for magnetic interaction with the magnetizable portion of the diaphragm. When alternating current

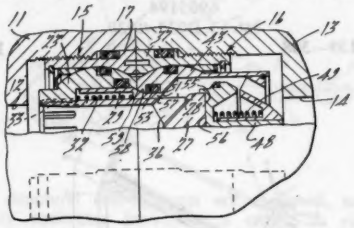
is applied to the electromagnetic coil of the transducer, the generated flux field interacts with that of the permanent magnet to change the flux field effective on the magnetizable portion. This causes the diaphragm to assume a new position with respect to the control nozzle for different current values applied to the coil, providing an output signal of the fluidic amplifier in accordance with the level of the energizing alternating current to the electromagnetic coil.

3,645,294

SELF-SEALING COUPLING

Alan R. Allread, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Oct. 19, 1970, Ser. No. 82,004
Int. Cl. F161 *37/22, 37/28*
U.S. Cl. 137—614.03 8 Claims



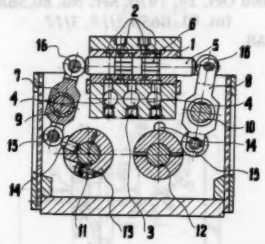
A self-sealing coupling for a manifold, so constructed as to permit slight misalignment of the manifold and accessory ports. The coupling comprises male and female cartridges which are mounted on the manifold and accessory members. Each cartridge comprises a housing mountable in the port, a ball segment body rockably carried by the housing, and a self-sealing coupling valve mounted in the body.

3,645,295

HYDRAULIC MULTISTAGE CONTROL SLIDE VALVE

Edmund Nowak, and Jerzy Korchow, both of Warsaw, Poland, assignors to Zaklad Doswiadczalny Pras Automatycznych Hydomat przy zakladach Mechanicznych Tarnow, Warsaw, Poland

Filed Apr. 8, 1970, Ser. No. 26,647
Claims priority, application Poland, Apr. 28, 1969, P.133,255
Int. Cl. F16k *11/02*
U.S. Cl. 137—624.13 5 Claims



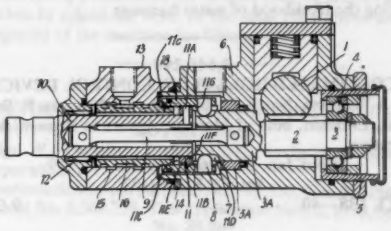
A hydraulic spool-type control valve has a slide shiftable in opposite directions to connect hydraulic devices with a source of fluid, and a drive for the slide including a pair of levers bearing on opposite ends of the slide in opposing directions and controlled by respective cams synchronously driven by a controlled-flow hydraulic motor.

3,645,296

POWER-ASSISTED STEERING AND LIKE SYSTEMS

Frederick John Adams, Campton, near Shefford, England, assignor to Cam Gears Limited, Hitchin, England

Filed Oct. 31, 1969, Ser. No. 872,919
Int. Cl. F16k *11/07*; F15b *9/10*
U.S. Cl. 137—625.69 2 Claims



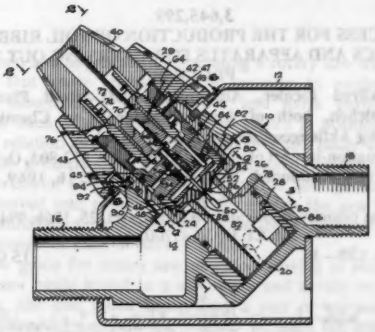
A power-assisting rack and pinion steering system including a housing, relatively rotatable torque input and output shafts mounted for rotation in the housing, a pinion mounted for joint rotation on the torque output shaft, a rack engaging the pinion and a fluid valve assembly for controlling the flow of fluid to and from the opposite ends of a double-acting servomotor also connected to the rack for assisting in the movement thereof. The valve assembly comprises a circumferentially grooved spool valve connected to one of said shafts for axial movement, such movement occurring when the shafts are rotated relative to one another. Axial movement of the spool valve establishes fluid communication between a power fluid pump and the servomotor for powered movement of the servomotor and hence the rack.

3,645,297

MULTIPLE ADJUSTMENT VALVE

A. C. Boultinghouse, 17533 Dearbourn Street, Northridge, Calif.

Filed Mar. 30, 1970, Ser. No. 23,905
Int. Cl. F16k *11/10*
U.S. Cl. 137—637.3 14 Claims



A valve for sinks and other applications which allows setting of water temperature and volume, in addition to enabling on-off actuation. The valve includes a housing with hot and cold water inlets, and a cartridge which is installed in the housing and which contains all of the mechanisms for controlling temperature, volume and on-off states. The entire cartridge can be turned to regulate the relative amounts of water from the hot and cold water inlets that can flow through a main passageway in the cartridge to the valve outlet. The main passageway of the cartridge includes a valve

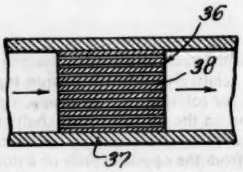
seat, and a diaphragm that can move towards and away from the seat to close and open the valve. A volume regulator controls the rate of flow when the valve is on, by limiting the distance that the diaphragm can move away from the valve seat. Every time the valve is opened or closed, a control passageway formed in the diaphragm is swabbed by a needle,, so that a small control hole can be utilized without the likelihood of becoming obstructed, the use of a small hole reducing the likelihood of water hammer.

3,645,298

COLLIMATED HOLE FLOW CONTROL DEVICE

John A. Roberts, North Chelmsford, and Norman F. Surprenant, Littleton, both of Mass., assignors to Brunswick Corporation

Filed Jan. 30, 1968, Ser. No. 701,779
Int. Cl. F15d *1/02*
U.S. Cl. 138—40 **9 Claims**



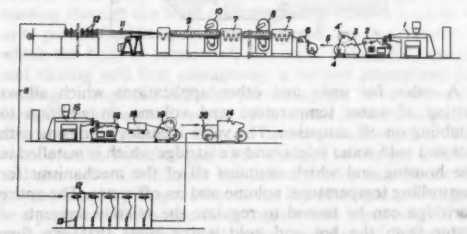
A flow control device formed of one or more collimated hole structures having a plurality of passages of preselected small cross-sectional area and having accurate configuration and arrangement. A plurality of such devices may be formed by cutting from a longer preform whereby the passages have accurate correspondence at the interface defined by the cut permitting the two elements to provide an accurate valving action as a function of lateral displacement therebetween. The collimated hole structure has in one form a preselected aspect ratio of the length to cross-sectional area to provide a preselected pressure drop for accurate control of fluid flow therethrough. The configuration of the passages may comprise a highly accurately rectilinear parallel configuration, as well as turned configurations and nonparallel configurations. Further, a portion of the device may be constricted to provide a corresponding constriction of the flow passage.

3,645,299

PROCESS FOR THE PRODUCTION OF FOIL RIBBON FABRICS AND APPARATUS FOR CARRYING OUT THIS PROCESS

Josef Alfred Eichler, Altmunster, and Alfred Plammer, Seewalchen, both of Austria, assignors to Chemiefaser Lenzing Aktiengesellschaft, Lenzing, Austria

Continuation-in-part of application Ser. No. 672,803, Oct. 4, 1967, now abandoned. This application Dec. 16, 1969, Ser. No. 885,440
Claims priority, application Austria, Oct. 25, 1966, 9941/66
Int. Cl. D03d *41/00, 15/00*
U.S. Cl. 139—11 **15 Claims**



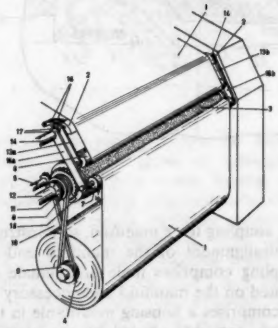
The invention comprises a process and an apparatus for the production of foil ribbon fabrics, wherein the warp ribbons and the weft ribbons are interwoven on a weaving device, at least the warp ribbons being cut from monoaxially stretched foil stock. The stretching device and the cutting device immediately precede the weaving device so that the plurality of warp ribbons cut from the monoaxially stretched foil can be directly and immediately fed to the weaving device. During stretching of the foil certain conditions are maintained, such as a small stretching gap, preferably electrostatic adherence of the foil to the stretching rolls, and specific temperature control.

3,645,300

TAKEUP MECHANISM FOR WEAVING LOOM

Pieter Theodorus Geven, Molenstraat 83, van Mullekom, and Peter Hubert, Voortseweg 11, Deurne, both of Netherlands

Filed Mar. 19, 1970, Ser. No. 21,034
Claims priority, application Netherlands, Apr. 2, 1969, 6905194
Int. Cl. D03d *49/20*
U.S. Cl. 139—308 **1 Claim**



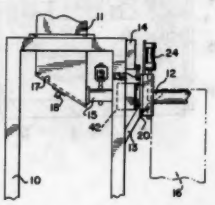
A weaving loom, in which a sand beam cooperates with at least one auxiliary beam for guiding the cloth, said auxiliary beam being movably supported in such a way, that the force exerted on said beam due to the tension in the cloth tends to press the auxiliary beam against the sand beam.

3,645,301

BAG VENTING DEVICE FOR VALVE BAG FILLING MACHINES

Erwin M. Lau, Dolton, Ill., assignor to Black Products Co., Chicago, Ill.

Filed Oct. 14, 1970, Ser. No. 80,568
Int. Cl. B65b *3/10, 3/17*
U.S. Cl. 141—68 **7 Claims**



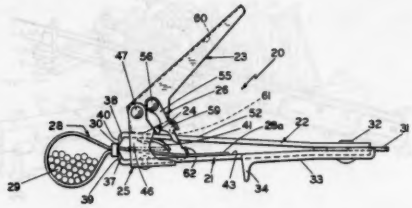
A pair of fingers are located immediately below the spout. They are mounted on a vertically sliding yoke, which has side rails engaging in grooves formed in vertical guides. The guides are mounted on the plate which supports the spout, one guide on each side of the spout. An air cylinder pushes

the yoke down so that the fingers will engage the valve opening of a bag suspended from the spout and stretch the opening to permit air to escape from the bag. The fingers when extended also clamp the bag to the spout.

3,645,302
STRAP INSTALLATION TOOL

Jack E. Caveney, Chicago; Roy A. Moody, Flossmoor, and Raymond F. Roberson, Tinley Park, all of Ill., assignors to Panduit, Tinley Park, Ill.

Filed Mar. 19, 1970, Ser. No. 20,927
Int. Cl. B21f 9/00
U.S. Cl. 140—93.2 **28 Claims**

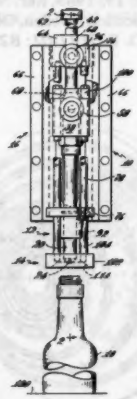


Two structural embodiments are disclosed, each has resiliently connected jaws with a cutter on each jaw cooperating with the cutter on the other jaw. A cam lever is pivotally mounted to one of the jaws and has a cam operatively engageable with the other jaw to operate and position the jaws relative to each other, and to operate a strap tensioning pawl.

3,645,303
FILLING APPARATUS

Sidney T. Carter, Schrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed Sept. 8, 1970, Ser. No. 70,125
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—7 **69 Claims**

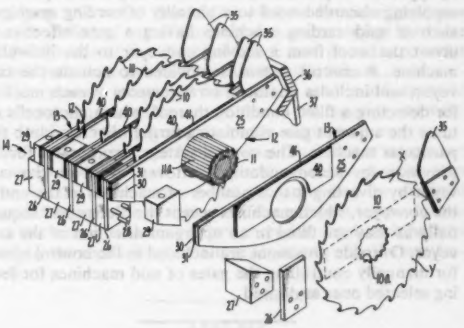


In a filling machine comprising a plurality of filling head assemblies movable along a predetermined path, each filling head assembly including a telescopically associated nozzle and sealing member adapted to be moved downwardly in unison toward a bottle supported therebelow to introduce the nozzle into the bottle and apply the seal to the top of the bottle, cam means for controlling the movement of the nozzle and sealing member to cause the nozzle of each assembly to be lowered into the bottle to an initial position such as to effect rapid filling without foaming up to the neck and then while raising the nozzle from such position to effect withdrawal from the neck but before breaking the seal effecting final filling to a predetermined final level without overfill, thereby to provide for a maximum rate of filling per filling head and means for adjusting the cam means during the operation of the machine by means of which the initial filling and final filling positions of the nozzles may be altered during operation to adjust the level of the final fill without altering the capacity of the machine for filling.

3,645,304
METHOD AND APPARATUS FOR OPERATING A ROTARY SAW

Elbridge W. Thrasher, Ukiah, Calif., assignor to Masonite Corporation

Continuation-in-part of, Ser. No. 791,930, Jan. 17, 1969, Patent No. 3,568,738. This application Nov. 2, 1970, Ser. No. 85,969
Int. Cl. B27b 5/34
U.S. Cl. 143—160 **3 Claims**



Method and apparatus for operating a rotary saw with saw guides that apply lateral surface pressure to guided saw blades mounted on a saw arbor and more particularly wherein each of a plurality of saw guides is positioned in spaced relation as to engage the sides of a saw blade with little or no pressure until after the saws have developed substantial inertia and speed of rotation, the saw guides then being moved into pressure engagement with the saw blades while simultaneously positioned to establish predetermined guide planes for each of the saw blades.

A saw guide for rotary saw machines having at least one rotary saw blade keyed to a saw arbor and axially movable thereon, the saw guide comprising a pair of substantially parallel support arms having contact surfaces for engaging opposite sides of a rotary saw blade, means for securing the support arms together in back of the trailing edge of the saw blade, and means for selectively positioning the support arms in predetermined spaced relation in front of the leading edge of the saw blade to establish a pressure contact with the guided saw blade or allow the support arms to move apart and release the pressure on the saw blade.

ERRATUM

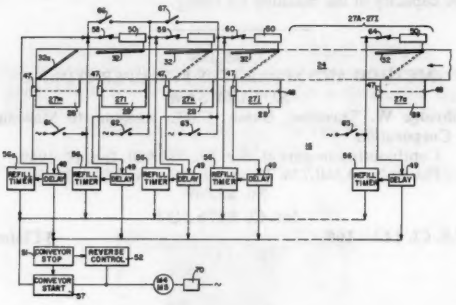
For Class 141—68 see:
Patent No. 3,645,301

3,645,305

FEEDING SYSTEM FOR WOOL-CARDING PLANTS AND THE LIKE

Gaston C. Warlop, 54 Hillview Ave., Union Villiage, Woonsocket, R.I.

Filed Dec. 4, 1969, Ser. No. 882,177
Int. Cl. D01g *23/00*
U.S. Cl. 141—198 16 Claims



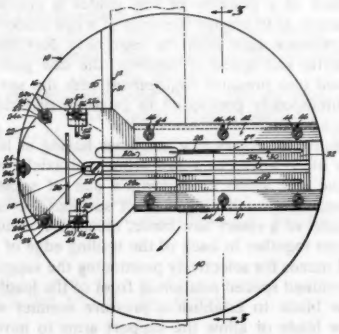
Apparatus is provided for automatically and sequentially supplying uncarded wool to a plurality of carding machines, each of said carding machines having a gate effective to divert the wool from a moving conveyor to the individual machine. A control system is provided to actuate the conveyor, and includes photocell arrangements at each machine for detecting a filled condition thereof, which photocells actuate the adjacent gate eliminating further diversion into that particular machine. The control system incorporates further provision for accommodating "leftover" wool on the conveyor by diverting it to a number of machines at the end of the conveyor, which machines accept the "leftovers" sequentially as they are filled in an upstream direction of the conveyor. Override provisions are included in the control system for manually controlling the gates of said machines for feeding selected ones as desired.

3,645,306

ANGLE GUIDE FOR ELECTRIC SAW AND ROUTER

George F. Adams, Sr., 2740 N.W. 172 Ter., Opa-Locka, Fla.

Filed July 17, 1970, Ser. No. 55,628
Int. Cl. B27b *9/04*
U.S. Cl. 143—6 G 9 Claims



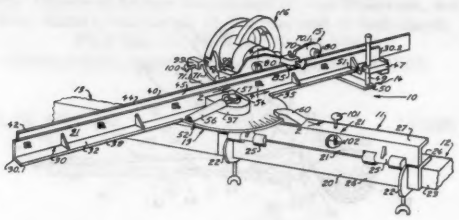
A saw guide adapted for use particularly with a portable motor-driven saw of the circular blade type or router which guide is adjustable to align the saw blade in either the rip position or crosscut position or gradients thereof in relation to the wood or material to be sawed in a manner which saves time and labor and assures the accuracy of the predetermined line along which the saw blade is to travel and worktable therefore.

3,645,307

POWER SAW GUIDE

Henry C. Stocker, Surrey, British Columbia, Canada, assignor to Protrack Industries Ltd., White Rock, British Columbia, Canada

Filed June 10, 1970, Ser. No. 44,940
Int. Cl. B27b *5/20*
U.S. Cl. 143—6 G 6 Claims



A power saw guide including a base frame adapted to be secured to a worktable, the frame having a guide rail adapted for adjustment about a vertical axis. A saw carriage is roller supported on the rail for longitudinal movement, a guide roller on the carriage being adjustable to permit the carriage to be levelled relative to the worktable.

ERRATUM

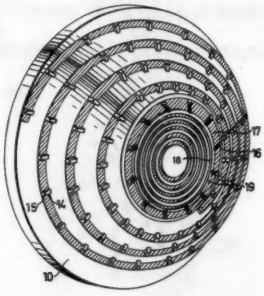
For Class 143—169 see:
Patent No. 3,645,304

3,645,308

LOG-LEVELLING MACHINES

Philip Nilsson, Kaptensgatan 3A, Soderhamn, Sweden

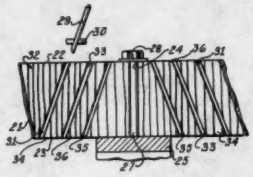
Filed Dec. 19, 1969, Ser. No. 886,496
Claims priority, application Sweden, Dec. 20, 1968, 17591/68
Int. Cl. B27l *11/02*; B27c *1/08*
U.S. Cl. 144—176 7 Claims



A log-levelling machine having at least one rotary cutter in the shape of a conical disc and a device for advancing logs in their longitudinal direction toward the rotary cutter or cutters. The machine operates to flatten the logs on their lateral sides by cutting the excess material into chips. According to the invention, that portion of each rotary cutter which is located next to the flattened surface of a log which is being cut is provided with a set of teeth adapted to cut chips of

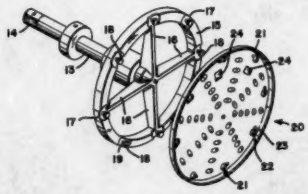
substantially smaller thickness than the chips cut by the remaining teeth of the cutter.

3,645,309
METHOD OF MAKING A HOLLOW WOODEN BLANK
Roger I. Canfield, 349 Fairview Ave., Cedar Grove, N.J.
Filed Jan. 6, 1970, Ser. No. 927
Int. Cl. B27m *1/00*
U.S. Cl. 144—326 7 Claims



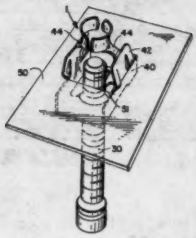
The blank is formed by first cutting an unseasoned log along two longitudinally spaced transverse planes to form a disklike slab, then cutting the slab along two concentric annular paths which are concentric to the growth rings of the wood, and thereafter seasoning the blank. One end of the hollow blank interior is usually closed by an end piece secured therein. The end piece is formed from a disk similar to the slab, but the disk is first severed along one of its diameters and seasoned, after which the end piece is cut from it. The blank may be cylindrical or frustoconical. One end of the hollow blank interior may be tapered to define a seat for accommodating a frustoconically shaped end piece.

3,645,310
FOOD MACHINE ATTACHMENT
Richard S. Hartley, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio
Filed Aug. 12, 1970, Ser. No. 63,077
Int. Cl. B26d *4/22*
U.S. Cl. 146—115 5 Claims



In a food machine attachment such as a grater, slicer, etc., the cutting disk of the attachment is fastened to a supporting hub by means of a series of keyhole slots formed in the disk and receiving headed studs mounted on the hub and the disk is locked onto the hub by means of resilient tabs struck from the disk and engaging spokes extending radially between the hub and a drive shaft. The number and spacing of tabs is selected such that at least one tab will be in engagement with a spoke regardless of which stud is received in which keyhole slot.

3,645,311
CONSTANT TORQUE THREADED FASTENER FORMATION
George A. Tinnerman, 3600 Stewart Ave., Miami, Fla.
Continuation-in-part of application Ser. No. 728,988, May 14, 1968, now Patent No. 3,476,163, which is a division of application Ser. No. 489,467, Sept. 20, 1965, now Patent No. 3,382,753. This application Nov. 3, 1969, Ser. No. 873,163
Int. Cl. F16b *39/30*
U.S. Cl. 151—41.75 1 Claim



A sheet metal nut formation is provided with helical edges engaging a threaded shank. One of these helical edges has a portion deflected out of the helical curve to engage the sides of the threads of the threaded shank and provides constant torque resistance to rotation of the threaded shank.

The constant torque nut formation is used in a fastener to receive an adjustment screw, guides on the fastener maintaining the shank in engagement with the nut formation.

A U-shaped clip-type fastener uses the constant torque nut formation on one arm in cooperation with a positive stop boss on the other arm so that the arms may be clamped together against the positive stop, the constant torque formation preventing loosening of one threaded shank and the boss guiding the shank to maintain engagement with the nut formation.

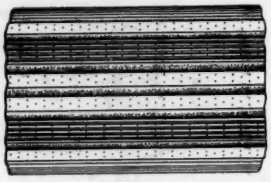
3,645,312
AUTOMOBILE TIRE INNER SUPPORT
Henry W. Kolodziej, 475 Atlantic Ave., Matawan, N.J.
Filed Aug. 11, 1969, Ser. No. 848,972
Int. Cl. B60c *17/04*
U.S. Cl. 152—158 2 Claims

A structure of annular form, fabricated of arcuate sections fastened together, is mounted within a tire and supported with respect to the rim thereof out of engagement with the periphery of the tire a distance sufficient to allow normal deflection of the tire, the device coming into operation to prevent the breaking of a tire casing upon loss of a predetermined amount of pressure in the tire or in the event of the puncturing or blowing out of the tire, the device thus carrying the load of the vehicle until the tire can be changed or suitable repairs made thereto.

3,645,313
PNEUMATIC TIRES

Glyn B. Roberts, Four Oaks, and Thomas Holmes, Walmley, both of England, assignors to Dunlop Holdings Limited, London, England

Filed Jan. 19, 1970, Ser. No. 3,822
Claims priority, application Great Britain, Jan. 23, 1969, 3,840/69
Int. Cl. B60c *11/10, 11/12*
U.S. Cl. 152—209 R 17 Claims

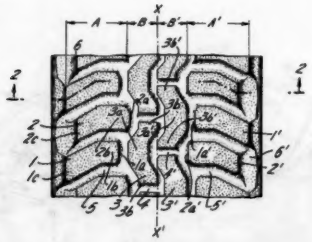


A tire having a tread portion the ground-contacting surface of which is provided with water-absorbing chambers extending into the depth of the tread rubber and closed at their inner ends. The chambers are of circular cross section at the surface of the tread and of diameter from 2.5 mm. to 0.25 mm. or have equivalent cross-sectional area at said surface and are of other cross-sectional shape. A portion at least, of the wall of each of a substantial number of the chambers is provided with asperities serving to restrict the flow of water into the chambers. The chambers are spaced apart at a distance of from 20 mm. to 0.375 mm. measured at the surface between a given reference point on the chambers and the quantity of chambers provided is such as to reduce the tread wearing surface of the tire by no more than 35 percent.

3,645,314
WIDE TREAD TIRE FOR HEAVY-DUTY VEHICLES

Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie Generale Des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France

Filed Jan. 30, 1970, Ser. No. 7,010
Claims priority, application France, Jan. 30, 1969, 6901996
Int. Cl. B60c *11/04*
U.S. Cl. 152—209 8 Claims

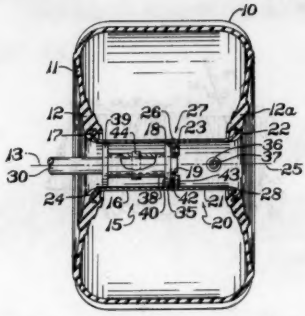


The median zone of the tread of a tire includes elements in relief directed longitudinally. Lateral zones on either side of the median zone include elements in relief directed transversely. Successive ones of the transverse elements in each of the lateral zones have inner ends alternately closer to and farther from the median plane. Different portions of the longitudinal elements are at different distances from the median plane. The longitudinal and transverse elements overlap at least partially.

3,645,315
ALL TERRAIN VEHICLE TIRES

Peter P. Spolsino, Revere; Nicholas V. Riselli, Belmont, and Kenneth C. Bushway, Waltham, all of Mass., assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,924
Int. Cl. B60c *5/16*
U.S. Cl. 152—383 5 Claims

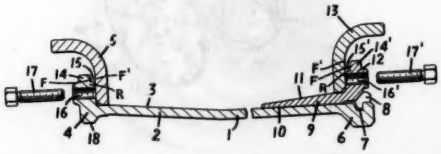


A tire hub, a method of manufacturing the hub, and the combination of the hub with an integral low-pressure tire are disclosed. The hub is formed of two coaxial, closed end, tubular sections, each having an integral base portion and a flange portion, the bases being in contact and secured to form a single hub with spaced-apart flanges on either end of the hub. The flanges portions of the hub are integrally molded into enlarged sidewall portions of an inflatable tire of elastomeric material thus forming an integral hub and tire of the low-pressure balloon-type suitable for use on all terrain vehicles.

3,645,316
WHEEL RIM FORMED WITH TOOL-RECEIVING GROOVES FACILITATING UNWEDGING OF TIRE

Henri Verdier, Puy-de-Dome, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Puy-de-Dome, France

Filed July 22, 1969, Ser. No. 843,514
Claims priority, application France, July 23, 1968, 160332
Int. Cl. B60c *7/24*
U.S. Cl. 152—410 4 Claims



A wheel rim for engineering equipment includes a rimbase forming one bead seat and supporting a continuous ring forming the other bead seat. A flange is integral with each bead seat, and each flange supports a hoop. Each flange is formed with a ridge delimiting a groove between the ridge and the corresponding hoop.

3,645,317

VENETIAN BLIND

Charles H. Malone, New York, N.Y., assignor to Charles H. Malone & Company, Inc., New York, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,337
Int. Cl. E06b 9/26
U.S. Cl. 160—168 8 Claims

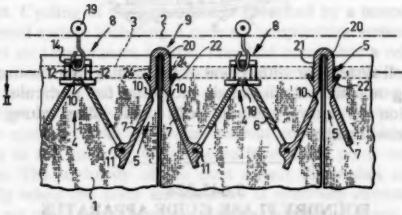
A Venetian blind is formed of strips which are provided with a thin layer of metal such that they reflect unwanted infrared radiation yet are substantially transparent to visible light except in the closed position when, by causing adjacent strips to overlap, the closed blind is substantially less transparent to visible light.

3,645,318

HOLDING AND GUIDING MEANS FOR CURTAINS, DRAPES, AND THE LIKE

Martin Holzlehner, Kirchwenderstr. 21, 3 Hannover, Germany

Filed Jan. 13, 1970, Ser. No. 2,467
Claims priority, application Germany, Jan. 14, 1969, P 19 01 489.2
Int. Cl. A47h 13/14
U.S. Cl. 160—348 7 Claims



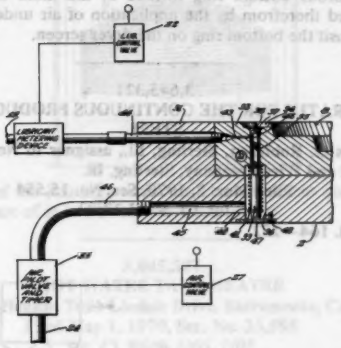
A suspending and guiding structure for web material with folds, especially drapes and curtains, according to which, of two groups of curtain carriers, the carriers of a first group are movably suspended by roller means on a rail while the curtain carriers of the second group which alternate with the carriers of the first group are carried particularly by the carriers of the first group thereby eliminating roller means from the carriers of the second group having reduced thickness hinge means therewith collectively permitting closer together folding of the folds, the carriers of each group having a head portion receiving and supporting the upper marginal portions of the drapes or the like and also having a pair of legs with the free end portions thereof pivotally connected to the free end portion of the respective immediately preceding and succeeding carrier leg, the legs of each carrier being tiltably connected to the head portion pertaining to the same carrier.

3,645,319

METHOD AND APPARATUS FOR LUBRICATING A CLOSED DIE STRUCTURE

William J. Pondelicek, Arlington Heights, and Vernon F. Schmidt, Chicago, both of Ill., assignors to Heick Die Casting Corp., Chicago, Ill.

Filed Feb. 24, 1970, Ser. No. 13,289
Int. Cl. B22d 17/20
U.S. Cl. 164—72 15 Claims



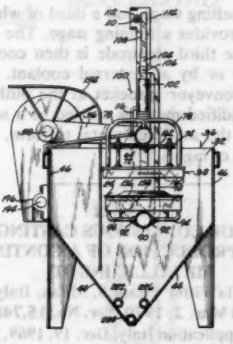
A method and apparatus for lubricating a die structure employed in diecasting operations, and die therefor, whereby a quantity of lubricant is injected under gas pressure into the die cavity, and in which the die may be provided with a chamber for receiving the die lubricant, which chamber communicates with the die cavity, the lubricant being discharged by gas under pressure into the die cavity, with the apparatus being constructed to effect discharge of lubricant into the chamber as the members of the die approach a closed position, and discharge of the lubricant into the die cavity when the die members are in a closed position.

3,645,320

APPARATUS FOR VACUUM FORMING HOT TOP BOTTOM RINGS

Anthony J. Varrati, Milwaukee, Wis., assignor to Universal Refractories Corporation, Milwaukee, Wis.

Filed July 20, 1970, Ser. No. 56,481
Int. Cl. B22c 13/00; B28b 1/26
U.S. Cl. 164—160 17 Claims



The method and apparatus for automatically forming a hot top bottom ring from a slurry containing a major portion of granular refractory material, minor portions of inorganic fibrous material and porous refractory material and a

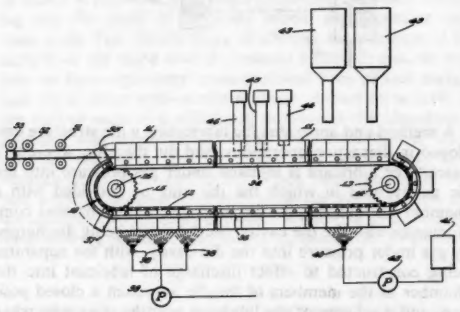
resinous binder. The apparatus includes a reservoir containing the slurry, a mold assembly, and a transfer mechanism for moving the mold assembly into and out of the slurry in the reservoir. The mold assembly includes an upper mold member and a lower mold member, the lower member being mounted for movement into engagement with and away from the upper mold member, and a vacuum system operatively connected to the mold assembly to draw the slurry from the reservoir into the mold assembly and to dewater the slurry during the movement of the mold assembly to a dryer screen. The fibrous bottom ring formed in the mold assembly is removed therefrom by the application of air under pressure to deposit the bottom ring on the dryer screen.

3,645,321

APPARATUS FOR THE CONTINUOUS PRODUCTION OF STEEL

Charles G. Robinson, Sterling, Ill., assignor to Northwestern Steel and Wire Company, Sterling, Ill.

Filed Mar. 2, 1970, Ser. No. 15,554
Int. Cl. B22d *27/02*
U.S. Cl. 164—252 **6 Claims**



Apparatus for continuously casting metal, such as steel, in which a series of interlocking molds are carried on a conveyor in end-to-end relation with respect to each other, and form scrap-receiving melting and cooling vessels for the metal. One or more hoppers for charging the molds with scrap or other meltable materials are provided at the inby end of the conveyor to discharge scrap into the molds. Melting is attained by three electrodes connected in the secondaries of a transformer in a three phase delta arrangement and progressively extending into the molds, a first of which effects the melt down of the scrap or other meltable material, a second of which has a shorter arc than the first and provides an intermediate melting stage and a third of which has a still shorter arc and provides a refining stage. The molten metal as carried past the third electrode is then cooled either by convection of air or by an external coolant. As the mold turns about the conveyor sprocket at the outby end of the conveyor, the solidified metal is carried to a series of roller stands which roll the solidified metal to form, where it may be cut in the form of ingots.

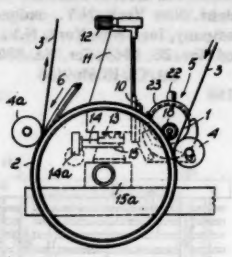
3,645,322

FEED DEVICE FOR CONTINUOUS CASTING MACHINES FOR THE PRODUCTION OF A CONTINUOUS METALLIC INGOT

Ilario Properzi, Via Vittor Pisani 8, Milan, Italy

Filed Mar. 2, 1970, Ser. No. 15,748
Claims priority, application Italy, Dec. 19, 1969, 26078A/69; Jan. 20, 1970, 19584A/70
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **3 Claims**

A feeding device for continuous casting apparatus arranged to pour molten metal into a peripheral groove of a casting wheel in order to obtain a continuous rod, and provided with a crucible which may oscillate around a substantially horizontal axis the latter being coincident with the axis of an outlet nozzle for the molten metal.

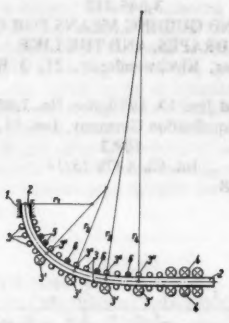


3,645,323

ROLL SYSTEM FOR CONTINUOUS CASTING MACHINES

Gerd Vogt, Schuerkesfeld, and Hans Schrewe, Duisburg-Ungelsheim, both of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Germany

Filed Jan. 14, 1970, Ser. No. 2,918
Claims priority, application Germany, Jan. 21, 1969, P 19 03 426.5
Int. Cl. B22d *11/12*
U.S. Cl. 164—282 **8 Claims**



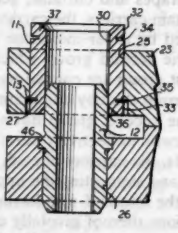
A roll system for withdrawal of the casting in a continuous casting machine is disclosed, providing for particular distribution of power driven rolls and idlers along the withdrawal path.

3,645,324

FOUNDRY FLASK GUIDE APPARATUS

Harlan E. Hicks, Martinsville, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed June 25, 1970, Ser. No. 49,681
Int. Cl. B22c *21/10*
U.S. Cl. 164—388 **8 Claims**



A guide pin and bushing assembly for use in the alignment of the cope and drag of a foundry flask or core box wherein

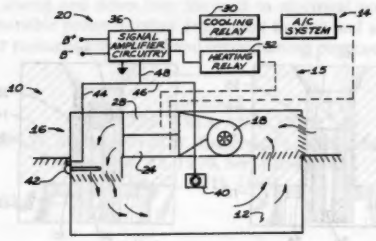
the bushing is reversible and is formed with two external annular grooves and carries a resilient retaining ring in one of said grooves. As the bushing becomes worn at one end on its interior through repeated frictional contact with the guide pin, it can be reversed to use the other end by removal of the retaining ring and replacing the ring in the other annular groove. This effectively doubles the useful life of the bushing.

3,645,325

AIR-CONDITIONING CONTROL SYSTEM FOR MINIMIZING OFFSET AND ZONE TEMPERATURE OSCILLATIONS

Jerome L. Lorenz, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Sept. 23, 1970, Ser. No. 74,305
Int. Cl. F25b *29/00*
U.S. Cl. 165—27 **9 Claims**



An air-conditioning system for a zone is disclosed which includes air-heating and air-cooling apparatus which are cycled for heating or cooling air moving to the zone through a duct. Cycling of the apparatus is governed by a temperature control system including a zone air temperature sensor and a duct air temperature sensor. The duct sensor has a relatively large authority in affecting control of the air-conditioning apparatus when the heating or cooling load on the zone is light so that variations in the duct air temperatures alone can effect cycling of the apparatus without any appreciable variation in the zone air temperature from a set point temperature. The authority of the duct sensor diminishes substantially when the zone temperature is relatively remote from the set point so that the conditioning apparatus is not cycled according to the duct air temperature.

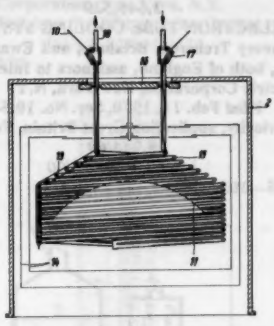
3,645,326

DEVICE FOR HEATING AND COOLING AN ENCLOSED CHAMBER

Paul Hochschorner, Frankenbach, and Fritz Kielwein, Neckarsulm, both of Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm am Danube, Germany

Filed July 8, 1969, Ser. No. 839,904
Claims priority, application Germany, July 27, 1968, P 17 58 719.8
Int. Cl. F25b *29/00*
U.S. Cl. 165—48 **11 Claims**

The invention relates to a device for heating and cooling an enclosed chamber comprising a cooling pipe within which is mounted a heating conductor. The cooling pipe is in the form of a coil, preferably of bifilar construction. The cooling pipe has a branchpiece at each end outside the chamber, the branchpieces being spatically separated and from which the ends of the heating conductor are taken. The resistance of



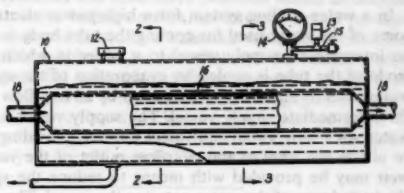
the ends of the heating conductor where it passes out of the chamber are of as low a resistance as possible.

3,645,327

HOT WATER TANK HEATER

George S. Henley, 7421 Lindale Drive, Sacramento, Calif.

Filed May 1, 1970, Ser. No. 33,595
Int. Cl. B60h *1/06, 1/08*
U.S. Cl. 165—51 **1 Claim**



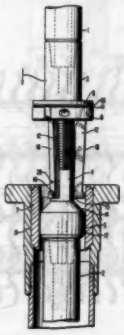
A radiator, a tank, a cylindrical passageway running through the tank, a pump for pumping heated radiator water through the cylindrical passageway, and a pump for pumping the heated water in the tank about the cylindrical passageway out of the tank for use.

3,645,328

RETRIEVING TOOL AND METHOD

H. Rowe Greene, Jr., Box 2905, 104 Honeysuckle Lane, Lafayette, La.

Filed June 22, 1970, Ser. No. 48,410
Int. Cl. E21b *17/12*
U.S. Cl. 166—85 **10 Claims**



A retrieving tool including extensible and retractable means for positive engagement with a wear bushing used in

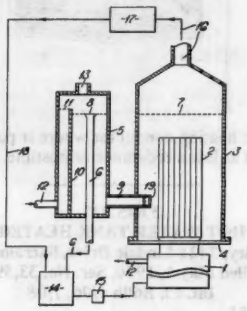
the oil-drilling industry, and capable of disengaging and removing such a wear bushing from its casing head.

3,645,329

ELECTRON TUBE COOLING SYSTEM

Thomas Harvey Treherne, Brixham, and Ewart Peter Coote, Paignton, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,541
Claims priority, application Great Britain, Feb. 19, 1969, 8,944/69
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **11 Claims**



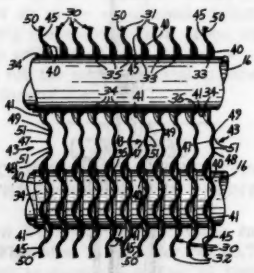
In a water-cooling system for a high-power electron tube, some of the water used for cooling the tube body is fed from an intermediate supply vessel to a boiler in which an electrode of the tube is cooled by evaporation of the water. The water level in the boiler is controlled by an overflow outlet of the intermediate supply vessel. The supply vessel is fed with water via a weir, or an equivalent thereof, providing water at or above the level of the overflow outlet of the vessel. The weir may be provided with means to reduce the speed and the turbulence of the water entering the vessel. The interconnection between the vessel and the boiler is located at a depth below the level of the overflow outlet and is also provided with means to reduce agitation of the water in the boiler and backflow of the water from the boiler to the vessel.

3,645,330

FIN FOR A REVERSIBLE HEAT EXCHANGER

John D. Albright, Minnetonka, and Raymond J. Myers, Wayzata, both of Minn., assignors to McQuay, Inc., Minneapolis, Minn.

Filed Feb. 5, 1970, Ser. No. 8,912
Int. Cl. F28d *1/00*
U.S. Cl. 165—151 **9 Claims**



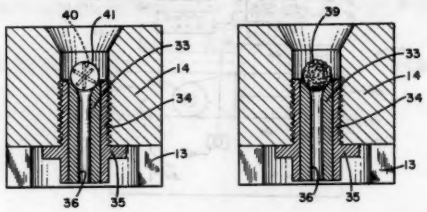
A sheet of material defining a pair of parallel opposed edges adapted to be positioned generally transverse to the direction of airflow through the exchanger, said sheet of material having a plurality of corrugations therein extending parallel to the edges and a plurality of openings therethrough for receiving fluid conduits therein, and a portion of said sheet of material adjacent said opposed edges extending at an angle, relative to a plane including the sheet of material, greater than zero and less than 45°, such that for any given set of conditions for the heat exchanger (including rate of airflow, number of fins per inch, etc.) the exchanger is reversible in the airflow, without inflicting a loss in the heat transfer or an increase in the pressure differential across the exchanger, and the air deflection at the outlet of the exchanger is approximately zero in either direction.

3,645,331

METHOD FOR SEALING NOZZLES IN A DRILL BIT

William C. Maurer, Houston; Joe K. Heilhecker, Bellaire, and Robert L. Graham, Houston, all of Tex., assignors to Esso Production Research Company

Filed Aug. 3, 1970, Ser. No. 60,234
Int. Cl. E21b *7/18*
U.S. Cl. 175—65 **12 Claims**



A method for selectively sealing nozzles in an erosion bit without removing the bit from the well comprising the steps of (a) plugging the nozzles centrally located in the bit with sealants including at least one temporary plug so that the bulk fluid flow is through the peripherally located nozzles; (b) plugging at least one of the peripheral nozzles with pumpdown sealants; and (c) thereafter removing the temporary plug. Depending on its composition, the temporary plug can be removed by erosion, pressure, thermal decomposition, or combinations thereof.

3,645,332

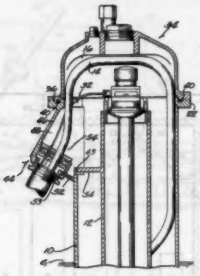
WELL CAP AND SEAL THEREFOR

John Gordon Baker, Evansville, Wis., assignor to Baker Manufacturing Company, Evansville, Wis.

Continuation of application Ser. No. 793,453, Jan. 23, 1967, now abandoned. This application May 11, 1970, Ser. No. 37,405
Int. Cl. F21b *33/03*
U.S. Cl. 166—75 **12 Claims**

A cap and conductor seal arrangement for a well having a tubular well casing with an upper portion extending out of the ground. A circular casing flange is eccentrically joined preferably by welding to the upper portion of the well casing and has an opening therethrough the same diameter as the inside of the well casing and aligned therewith. The casing flange has a conductor opening located beyond the radius of said opening. A circular cap member having a flange thereon adapted for mating engagement with the casing flange is pro-

vided. The joint between the flanges is hermetically sealed by an O-ring sealing member mounted in a circular groove in the casing flange. A conductor housing attached to said casing flange and the well casing is provided. The conductors approach the well in a conduit, enter on a slant through an



aperture in the bottom of the conductor housing, pass through a conductor seal and continue upwardly on a curved path through said conductor opening then over the top of the well casing and down into the well to electrical power to a submersible pump or other equipment therein and air and/or water passages for control and measurement purposes.

3,645,333

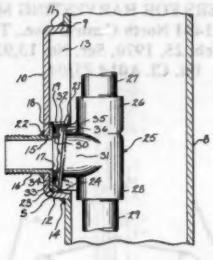
PITLESS WELL ADAPTERS

Herbert W. Maass, 10940 W. Congress St., Milwaukee, Wis.

Filed Sept. 23, 1970, Ser. No. 74,663

Int. Cl. E21b *33/03*

U.S. Cl. 166—85 **10 Claims**



A well casing has a boxlike adapter extension projecting laterally therefrom and there is a tubular nipple extending through an upright wall of the box above the bottom thereof, the nipple carrying an enlarged stainless steel bearing face within the wall of the adapter box which bearing face is provided with integral guideways at opposite sides thereof for receiving a wedge block projecting from a bronze T-fitting, said T-fitting and wedge block having a lateral passageway registrable with the opening of the nipple. The guideways are open at the bottom to allow the lower edge of the wedge block to project a short distance therethrough so that the ends of said lower edge contact the arcuate bottom wall of the adapter box when the wedge block is in operative position with respect to the nipple. Thus the load is carried by the bottom wall of the adapter box rather than by the guideway of the nipple. The nipple and guideway are of stainless steel to prevent electrolytic action and the wedge and guideways provide for a fast sealing engagement at the end of the insertion.

ERRATUM

For Class 166—85 see:
Patent No. 3,654,328

3,645,334

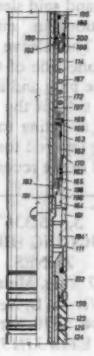
WELL PACKER APPARATUS

Howard L. McGill, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 7, 1970, Ser. No. 26,384

Int. Cl. E21b *33/129*

U.S. Cl. 166—120 **20 Claims**



A well packer apparatus having a mandrel movable between extended and contracted positions within an anchor body that carries holddown slips, an internal bypass passage that is opened and closed by a balanced valve sleeve movable longitudinally relative to the mandrel and the anchor body, first coengageable elements to prevent operation of said slips when the mandrel ix extended, second coengageable means to move said valve sleeve to closed condition as the mandrel is moved to contracted position, and a mechanical interlock to releasably secure the mandrel in contracted position.

3,645,335

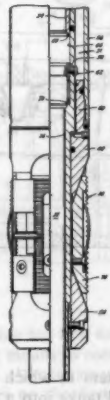
SLIDING SLEEVE ASSEMBLY FOR A HYDRAULICALLY SET WELL PACKER

James H. Current, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Nov. 27, 1970, Ser. No. 93,023

Int. Cl. E21b *23/00*

U.S. Cl. 166—179 **5 Claims**



A sliding sleeve assembly for opening the setting port of a hydraulically set well packer which may be reversibly positioned for actuation in either an upwardly or downwardly direction. A shearable plug initially blocking the setting port

and positioned in an elongate recess in the packer which extends equal distances on either side of the setting port with a shoulder at each end of the recess and a sliding sleeve telescopically positioned in the recess and in engagement with the plug whereby when the sleeve is longitudinally moved the plug is sheared. One end of the sleeve extending from the axis of the port a distance equal to one-half the length of the recess whereby the one end will engage one of the shoulders at the end of the recess and said sleeve may be positioned in the recess for actuation in either the upwardly or downwardly direction. The sleeve including an actuation shoulder positioned on one side of the plug when the sleeve is in engagement with the plug and including a wedge-shaped shoulder on the second side of the plug protecting the plug but allowing passage of a setting tool. The shoulders at the ends of the recess being tapered for retracting a setting tool after the sleeve is shifted in the recess.

3,645,336
METHOD FOR PLUGGING HIGHLY PERMEABLE ZONES

Charles W. Young, 4417 Yale, Metairie, La., and Charles F. Blankenhorn, 631 La Vereda Drive, La Habra, Calif.

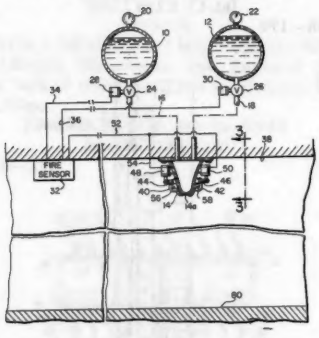
Filed Feb. 24, 1970, Ser. No. 13,776
Int. Cl. E21b *33/13, 33/138*
U.S. Cl. 166—288 **9 Claims**

Steam, sodium silicate and a gelling agent are mixed adjacent the exposed face of a highly permeable zone and then injected therein. The silica gel plug formed in the zone is hard, glassy and substantially impermeable.

3,645,337
FIRE CONTROL SYSTEM

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Dec. 29, 1969, Ser. No. 888,373
Int. Cl. A62c *35/00*
U.S. Cl. 169—14 **9 Claims**

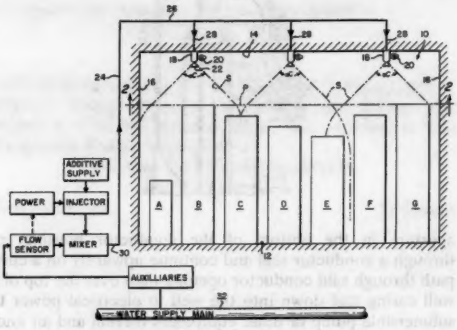


A fire control system in which two fluids are dispensed from two pressurized tanks into a mixing chamber disposed at an elevated position with respect to the floor of the structure to be protected, where they are mixed to form a gel. The gel is continuously discharged from the chamber and forms a gas-impervious sheet extending to the floor to act as a fire barrier.

3,645,338
FIXED FIRE-EXTINGUISHING SYSTEM

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Oct. 8, 1969, Ser. No. 864,612
Int. Cl. A62c *35/00*
U.S. Cl. 169—16 **10 Claims**

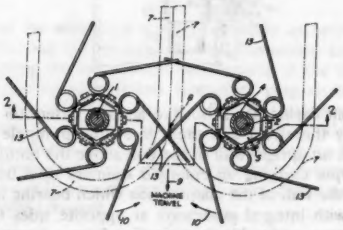


A fixed fire protection system and method by which discrete areas of extinguishant coverage are selected for each of several nozzle heads on the basis of the maximum elevation of fuel surfaces in the space protected.

3,645,339
SPRING FINGERS FOR HARVESTING MACHINES

Julian E. Williams, 1441 North Central Ave., Tifton, Ga.

Filed Feb. 25, 1970, Ser. No. 13,933
Int. Cl. A01d *25/04*
U.S. Cl. 171—61 **5 Claims**



The invention relates to a device applied to a harvesting machine and composed of spring fingers to guide and aid in gathering and directing vines or plants from the plow blade to thereby direct the plants and vines to a plurality of cooperating chains.

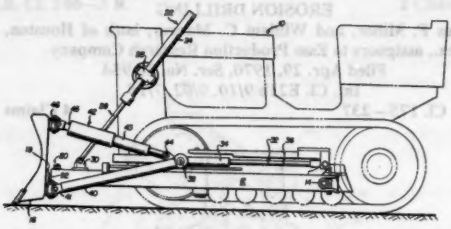
3,645,340
CONTROL SYSTEM FOR A DOZER BLADE

Claude M. Frisbee, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 5, 1969, Ser. No. 874,303
Int. Cl. E02f *3/76*
U.S. Cl. 172—804 **5 Claims**

A control system for a dozer blade or the like incorporating valving for combining with a tilt control for the blade tilt

motors and hydraulic circuitry for the lift motors to additionally provide blade pitch control. Also disclosed is a ball



and socket connection for connecting the dozer blade to the dozer frame.

3,645,341

PNEUMATIC NUT-RUNNER HAVING A TORQUE SENSING DEVICE

Lester A. Amtsberg, Utica, and William K. Wallace, Barneveld, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Original application Dec. 3, 1968, Ser. No. 788,220, now Patent No. 3,538,763, dated Nov. 10, 1970. Divided and this application Apr. 13, 1970, Ser. No. 27,822

Int. Cl. B25b *23/14*

U.S. Cl. 173—12 **4 Claims**

A torque sensing device is attached to a bearing mounted housing of a pneumatic nut-running tool. The device utilizes torque reaction transmitted through the tool to the housing to cause actuation of an external push rod to operate a microswitch in a signal circuit when torque of a preset valve has been delivered to the work. As the reactionary torque in the tool is relaxed, the torque sensing device progressively automatically returns to normal condition. The tool is bearing mounted in a supporting block that is fixed to a gang-plate adapted to be held stationary. The gang-plate is adapted to carry a plurality of such tools, the torque sensing device of each of which is associated with a separate microswitch in a common signal circuit.

3,645,342

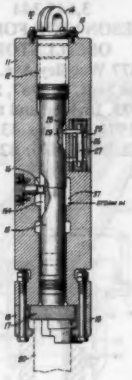
PERCUSSION HAMMER

George C. Wandell, Soddy, Tenn., assignor to Vulcan Iron Works Inc., Chattanooga, Tenn.

Filed June 1, 1970, Ser. No. 42,338

Int. Cl. B23g *5/00*

U.S. Cl. 173—17 **2 Claims**



There is provided a percussion hammer of the type used for driving piles and the like, and including a differential diameter piston defining a ram reciprocally positioned within a differential diameter cylinder. An anvil is mounted for limited movement in one end of the cylinder positioned in the path of the ram to receive percussion blows therefrom. Valve means are provided for controlling the inlet of working fluid and the exhaust of the working fluid from the cylinder so as to cycle the ram through power and return strokes. Safety means are provided for rendering the valve inoperative to cycle the ram when the percussion hammer is out of engagement with a pile.

3,645,343

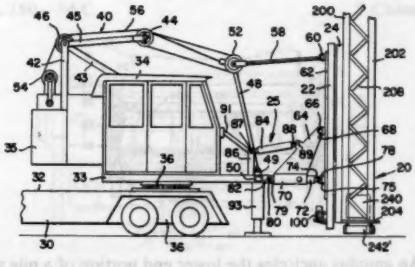
ROTARY DRILLING MACHINE

Gordon E. Mays, 245 27th Ct. N.W., Birmingham, Ala.

Filed May 11, 1970, Ser. No. 36,363

Int. Cl. E21b *3/02*

U.S. Cl. 173—43 **20 Claims**



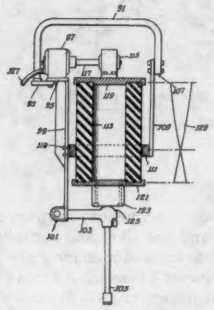
A rotary drilling machine has first and second frames connected by rotary bearing means to rotate on a first axis perpendicular to the frames. A mast assembly is carried by the second frame and rotates on the first axis. In the mast assembly is a moveable platform carrying a drill pipe and casing fixture. The casing fixture releasably supports a casing. Supports in the mast assembly permit the drill pipe and casing to move up and down together, or to permit the casing to move independently of the pipe and core or vice versa. A

hollow core in the drill pipe rotates with the pipe and feeds fluid to a drilling area. The fluid is drawn up between the casing and drill pipe. A rotary joint structure connects the first frame to rotatable carrier of a gantry and draw works to rotate on a horizontal second axis. Moveable supports in the first and second frames permit the mast assembly and second frame to move longitudinally with respect to the first frame.

3,645,344
ELASTOMER RESONATOR FOR ORBITING-MASS OSCILLATOR

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.

Original application Sept. 8, 1967, Ser. No. 666,398, now Patent No. 3,544,073. Divided and this application June 4, 1970, Ser. No. 43,447
Int. Cl. B06b *1/16*; B25d *11/04*
U.S. Cl. 173—49 **4 Claims**

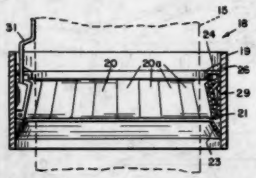


An orbiting-mass oscillator is coupled to a low-impedance elastomer in which a resonant standing-wave pattern can be established. The elastomer serves as a transmission and energy storage medium for the energy and is coupled to a free-standing heavy mass.

3,645,345
DYNAMIC PILE-DRIVING SHOES

Horace W. Olsen, Houston, and Max Bassett, P.O. Box 808, South Houston, both of Tex., assignors to said Bassett, by said Olsen

Filed July 14, 1970, Ser. No. 54,774
Int. Cl. E21b *1/06*
U.S. Cl. 175—56 **8 Claims**



An annulus encircles the lower end portion of a pile which is impacted at its upper end. The annulus contains a radially contractable and expansible collar consisting of a plurality of individual segments, and an expansible and contractable hollow ring is interposed between the annulus and the collar. The collar is actuated by hydraulic fluid under pulsating pressure, so that the collar segments impart vibration to the pile while it is being driven into the earth. The hollow ring has at least two segmental sections each spanning only a portion of the total number of collar segments, and the hydraulic fluid supply is controllable by valves so that the ring segments may be actuated in unison or in alternating succession.

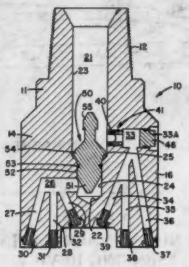
ERRATUM

For Class 175—65 see:
Patent No. 3,645,331

3,645,346
EROSION DRILLING

James F. Miller, and William C. Maurer, both of Houston, Tex., assignors to Esso Production Research Company

Filed Apr. 29, 1970, Ser. No. 32,954
Int. Cl. E21b *9/10*, *9/02*, *7/18*
U.S. Cl. 175—237 **4 Claims**

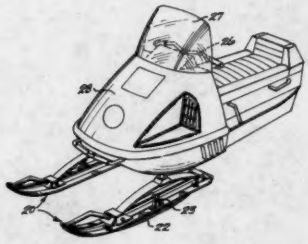


An erosion bit for earth-drilling operations having a first nozzle system open for conducting drilling fluid and a second nozzle system closed by a pressure-sensitive closure means. Means are provided for plugging the first nozzle system and for actuating the pressure-sensitive closure means to open the second nozzle system. Drilling fluid can initially be flowed through the first nozzle system until the nozzles become eroded and then through the second nozzle system.

3,645,347
GUIDE MEANS FOR SKIS

Williard L. Brant, 12044 78th S., Seattle, Wash.

Filed May 26, 1971, Ser. No. 146,862
Int. Cl. B62b *17/02*
U.S. Cl. 180—5 **9 Claims**



An adjustable guiding and steering means for a ski which may be utilized to enhance the controllability of skis on difficult terrain is described. The guide means comprises a guide member having a portion thereof positioned beneath the surface of the skis and resiliently forced into contact with the snow or ice. The degree of penetration into the snow or ice is governed by the amount of resilient force applied to a downwardly bowed segment of the guide means. The guide means is useful in aiding both human skiers and snowmobiles to negotiate corners and maintain balance on terrain such as crusted snow or ice.

3,645,348

POWER SKI

Richard F. Thompson, Glen Ellyn, Ill., assignor to Royce Hill Husted, Glenn Ellyn, Ill.

Filed May 29, 1969, Ser. No. 828,968
Int. Cl. B62m 27/00
U.S. Cl. 180—5 R 2 Claims

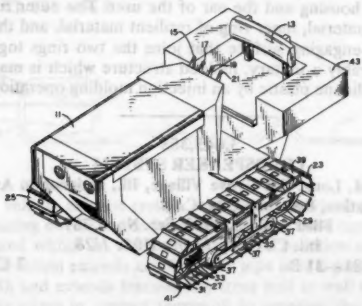
This invention relates to a ski equipped with mechanical propelling means to propel the ski over snow-covered surface; the under surface of the ski slides over the snow at all times, and the mechanical propelling means may be engaged and disengaged from the snow surface.

3,645,349

DRIVE FOR A REDUCED SCALE TRACK-LAYING UTILITY VEHICLE

David E. Nichter, R.R. 2, Churubusco, Ind.

Filed Jan. 5, 1970, Ser. No. 1,069
Int. Cl. B62d 11/04
U.S. Cl. 180—6.48 5 Claims



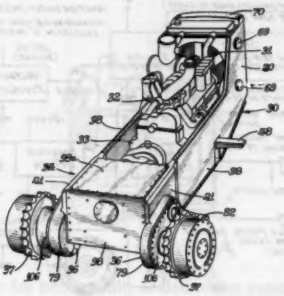
A unique drive arrangement for a hydraulically powered tractor unit characterized by its uniform and efficient power distribution is disclosed. In a first embodiment, one pool of each of two dual spool control valves regulates the flow of hydraulic fluid between individual pumps and motors for each track of the vehicle, the second spool of each of the control valves being available to actuate accessories on the vehicle. In a second embodiment, a single pump through a dual spool valve operates the accessories while a tandem pump through individual single spool valves operates each of the drive motors.

3,645,350

FRAME WITH DOUBLE WALLS FOR CRAWLER TRACTOR

Jack M. Deli, Wheaton; Frank J. Kowalczyk, Lincolnwood; Ronald J. Fanslow, Lexington Field, and Marino J. Pisani, North Riverside, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 30, 1970, Ser. No. 8,200
Int. Cl. B62d 55/00
U.S. Cl. 180—9.2 R 15 Claims



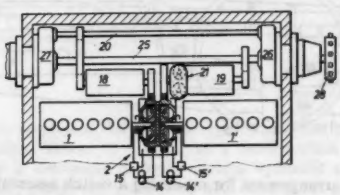
Integrated tractor frame of double-wall construction. Each of two sides of the front section of the tractor frame comprises two spaced parallel walls secured to one another by top and bottom strips and having upwardly extending front portions for mounting a radiator for the tractor. Each of two sides of the rear section of the tractor frame is formed of a double-wall casting provided with an elephant ear at which is located the driving connections between the steering drive mechanism within the rear section of the tractor frame and the sprocket for driving a loop of track links.

3,645,351

DUAL-ENGINE VEHICLE AND METHOD OF OPERATING THE SAME

Helmut Muller, Heidenheim, Germany, assignor to Voith Getriebe KG, Heidenheim, Germany

Filed July 29, 1970, Ser. No. 59,211
Claims priority, application Germany, Aug. 13, 1969, P 19 41 152.0
Int. Cl. B60k 5/08
U.S. Cl. 180—54 C 7 Claims

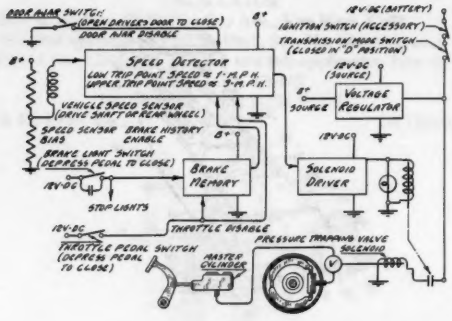


In a tank having a pair of supercharged engines for driving the transmission via a hydraulic torque converter having a controllable bypass coupling, vibration control and efficiency are improved by providing for the engines individual fluid couplings with a common output to a controllable converter for adaption to the power level. Controllable guide vanes of the converter serve to block the hydraulic coupling when the bypass coupling is operative.

3,645,352
ANTICREEP BRAKE SYSTEM FOR A WHEELED VEHICLE

Clarence C. Stark, Plymouth, and Carlos M. Barrera, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 22, 1970, Ser. No. 48,066
Int. Cl. B60t 7/12
U.S. Cl. 180—82 14 Claims

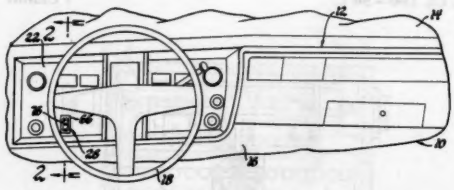

DOOR AJAR SWITCH (OPEN DRIVER'S DOOR TO CLOSE)
DOOR AJAR DISABLE
IGNITION SWITCH (ACCESSORY)
TRANSMISSION MODE SWITCH (CLOSED IN "D" POSITION)
SPEED DETECTOR
LOW TRIP POINT SPEED IS 1-P.P.H.
UPPER TRIP POINT SPEED IS 3-P.P.H.
VOLTAGE REGULATOR
VEHICLE SPEED SENSOR (DRIVE SHAFT OR REAR WHEEL)
SPEED SENSOR BIAS
BRAKE HISTORY ENABLE
BRAKE LIGHT SWITCH (DEPRESS PEDAL TO CLOSE)
BRAKE MEMORY
SOLENOID DRIVER
STOP LIGHTS
THROTTLE DISABLE
PRESSURE MAPPING VALVE SOLENOID
THROTTLE PEDAL SWITCH (DEPRESS PEDAL TO CLOSE)
MASTER CYLINDER

An automatic, creep control brake system for a wheeled vehicle having fluid pressure operated brakes including a valve in the pressure line for the vehicle wheel brakes which retains driver developed brake pressure while the vehicle is stationary, and an electronic control system responsive to wheel speed, brake pedal application and throttle movement to control the pressure retaining valve so that the wheel braking pressure is relieved automatically while the vehicle is operating under normal operating conditions and to apply anticreep braking pressure automatically after the vehicle is brought to a stop by the wheel brakes.

3,645,353
CONTROL ELEMENT MOUNTING ARRANGEMENT

Kenneth P. Cope, Warren, and Donald G. Baer, Girard, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1970, Ser. No. 31,083
Int. Cl. B60k 37/06
U.S. Cl. 180—90 3 Claims

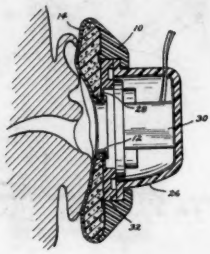


An arrangement for mounting a switch assembly on a vehicle instrument panel structure so as to be releasable under impacts, the arrangement including a receptacle having a hook-shaped projection and a cantilever spring-type latch element with a cam surface thereon. The switch assembly and receptacle are unitized and the hook-shaped projection on the latter engages the lower margin of an aperture in the panel structure to detachably mount the switch and receptacle unit on the panel structure for pivotal movement between a mounted position in the aperture and a releasing position angularly spaced from the mounted position. The latch member resiliently engages the panel structure to maintain the receptacle in the mounted position and the cam surface is operable under a force of impact on the receptacle to initiate deflection of the latch member and release of the switch and receptacle unit for pivotal movement from the mounted to the releasing position.

3,645,354
EARPHONE PAD

Donald L. Kliewer, Minneapolis, Minn., assignor to The Telex Corporation, Tulsa, Okla.

Filed Oct. 1, 1970, Ser. No. 77,174
Int. Cl. G02k 13/00; H04r 25/00
U.S. Cl. 181—23 8 Claims

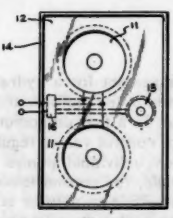


An earphone pad for use in combination with an earphone structure that has a peripheral flange around its housing for supporting an earphone pad and a circular opening in the housing for communicating acoustical vibrations from an electroacoustical transducer within the housing to the ear of a user. The earphone pad has an outer ring of resilient material which is dimensioned to sealably engage the flange on the housing and provide an outer acoustical seal therearound and an inner ring of resilient material which is dimensioned to sealably engage the periphery of the opening in the housing to provide an inner acoustical seal therearound. The inner and outer resilient rings are joined together in substantially coaxial relationship by a relatively thin annular sheet of resilient material which constitutes the ear-engaging surface of the earphone pad. An annular pad of resilient material is positioned on the inside of this ear-engaging surface to provide an acoustical seal between the earphone housing and the ear of the user. The outer ring of resilient material, inner ring of resilient material, and the annular ear-engaging surface that joins the two rings together are preferably a unitary, molded structure which is made of surgical silicone plastic by an injection molding operation.

3,645,355
LOUDSPEAKER SYSTEM

Edward M. Long, Elk Grove Village, Ill., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 26, 1970, Ser. No. 5,787
Int. Cl. G10k 13/00; H04r 1/28
U.S. Cl. 181—31 B 7 Claims



A loudspeaker system which achieves a relatively uniform increase in response over a particular low-frequency range by

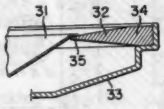
means of a preselected center-to-center spacing of from about 6 inches to about 9 inches between two direct-radiating bass speakers which are mounted in substantially the same plane on the face baffle of a sealed enclosure and which are connected in parallel with the same polarity. Such a dual woofer speaker system has an improved frequency response rolloff characteristics and provides improved reproduction of the impact sound of percussion instruments.

3,645,356

LOUDSPEAKER

Hiromi Sotome, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Dec. 23, 1970, Ser. No. 100,959
Claims priority, application Japan, Dec. 26, 1969, 44/104291
Int. Cl. G10k *13/00*; H04r *7/00*
U.S. Cl. 181—32 R **1 Claim**



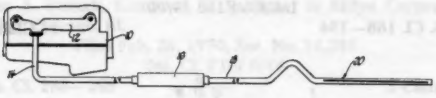
A loudspeaker including a diaphragm, means for driving said diaphragm, an annular suspension member of rubberlike elastic material attached to the marginal edge of said diaphragm and a supporting frame to which said suspension member is fixed, characterized in that said suspension member has a relatively large radial width and a tapered thickness which gradually decreases from the outer peripheral portion to the inner peripheral portion, and said member is fixedly connected at said outer peripheral portion to the supporting frame and at said inner peripheral portion to said marginal edge of the diaphragm.

3,645,357

QUARTER-WAVE TUNER STRUCTURE

Thomas R. Cassel, 226 Shirley, Birmingham, Mich.

Filed Aug. 20, 1970, Ser. No. 65,375
Int. Cl. F01n *1/02, 7/18*
U.S. Cl. 181—36 B **14 Claims**



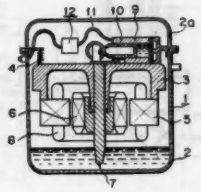
A vehicle exhaust system is disclosed in which a sound-attenuating device in the form of a quarter-wave tuner is incorporated within an exhaust gas pipe. A partition of sheetlike construction extends axially of the pipe over a predetermined length and extends transversely from wall to wall with its opposite edges in contact therewith to separate the space into first and second portions. In the tuner structure the length is approximately equal to one-fourth of the wavelength of the sound energy to be attenuated and the upstream end of the partition is located at a pressure point corresponding to the wavelength to be attenuated and the downstream end of the partition is closed. The pipe is formed with protuberances on the internal surface such as would result from indentations of the wall and the protuberances are arranged along the length of the pipe to retain the sheetlike partition in place in engagement with the wall of the pipe. This construction permits the location of the partition in an exhaust gas pipe to form a sound-attenuating structure in either a straight or curved section of the pipe so that the pipe and the attenuating structure may be fit into the available space under the vehicle body.

3,645,358

MUFFLER FOR HERMETICALLY SEALED MOTOR COMPRESSORS

Tadao Kubota; Takashi Matsuzaka, and Seizi Inokuchi, all of Fuji, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 29, 1970, Ser. No. 102,453
Claims priority, application Japan, Oct. 27, 1970, 45/106249
Int. Cl. F01n *1/02*
U.S. Cl. 181—36 R **4 Claims**



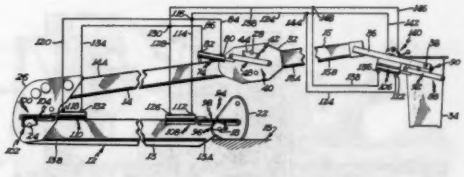
A muffler for hermetically sealed motor compressors comprising a muffler cup constituting a resonance chamber therein, two linearly arranged tubings penetrating the muffler cup and engageably joined in its interior so as to constitute a gas passage and a plurality of openings formed at the joint of said tubings so as to cause their interior to communicate with the resonance chamber whereby noises generated by compressed gases are absorbed in the resonance chamber through said openings for silent operation of a compressor.

3,645,359

APPARATUS FOR AUTOMATICALLY MAINTAINING THE ANGULAR POSITION OF AN AERIAL PLATFORM USED IN CONJUNCTION WITH A BOOM

James W. Raymond, Duluth, Minn., assignor to Reach-all Manufacturing Co., Duluth, Minn.

Filed Aug. 13, 1970, Ser. No. 63,570
Int. Cl. B66f *11/04*
U.S. Cl. 182—2 **10 Claims**

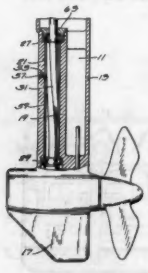


Hydraulic apparatus for maintaining the angular position of an operator basket on the end of a three-section articulated boom is disclosed. A double acting hydraulic cylinder and rack and pinion are associated with each pivot point on the boom, including the pivot point between the operator basket and the end of the boom, such that rotational movement of any or all joints in the boom causes a corresponding movement of hydraulic fluid at all joints. The double-acting cylinders are interconnected, major area to major area and minor area to minor area, such that a net rotation of the boom sections about the joints of the boom provides a net amount of hydraulic fluid to the cylinder associated with the basket to thus rotate the basket according to the net amount of rotation of the boom sections to thus maintain the angular position of the basket with respect to a fixed reference.

3,645,360
UPPER BEARING LUBRICATION FOR OUTBOARD GEARCASE

Theodore J. Holtermann, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 12, 1970, Ser. No. 19,050
Int. Cl. F16n *13/00*
U.S. Cl. 184—6.18 4 Claims

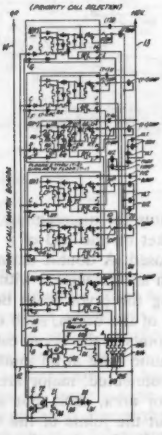


An arrangement for lubricating the upper bearing for a drive shaft in a marine propulsion drive shaft housing. In accordance with the invention, the drive shaft below the bearing is housed in a cavity which has a cross-sectional dimension only slightly greater than that necessary to afford rotation of the shaft. The cavity is provided with oil so that the cavity is only partially full when the shaft is not rotating, and the shaft is formed, below the bearing, with a noncircular cross section so that shaft rotation raises the level of the oil in the cavity and communicates the oil with the lower bearing.

3,645,361
ELEVATOR CONTROL SYSTEM WITH PRIORITY DISPATCHING CAPABILITY

James H. Stichweh, Princeton, Ind.; Stephen A. Hornung, Neuilly-sur-Seine, France, and Paul Duckwall, III, Louisville, Ky., assignors to K. M. White Company, Inc., Louisville, Ky.

Filed May 5, 1970, Ser. No. 34,839
Int. Cl. B66b *1/22*
U.S. Cl. 187—29 R 26 Claims

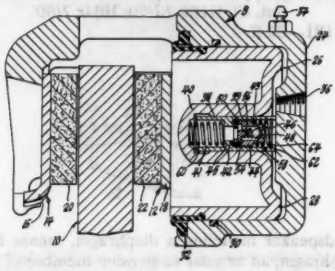


In a multicar elevator system, means are provided to assign priority status to a call for service having the longest waiting time. The nearest available car to the landing at which that call is made is assigned to respond to only that call. The car responding to a priority call may also be assigned to respond to calls made at an adjacent located in the direction of travel of the car to the priority call landing.

3,645,362
KICKBACK CONTROL AND WEAR ADJUSTMENT MECHANISM FOR DISC BRAKE

Elias W. Scheibe, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 4, 1970, Ser. No. 34,445
Int. Cl. F16d *65/52*
U.S. Cl. 188—71.8 6 Claims

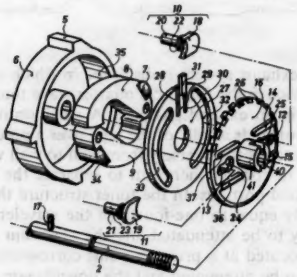


A disc brake caliper including a valve mechanism communicating with an expansible chamber interposed between the piston and the caliper; the valve mechanism maintaining a residual pressure in the expansible chamber to limit the travel of the piston into the caliper housing following each brake release to compensate for wear and controlling further piston movement into the caliper upon relative movement of the disc and caliper during vehicle cornering.

3,645,363
SPEED-REGULATING DEVICE

Gustav Fuths, Feldhorn, Germany, assignor to Olympia Werke AG, Wilhelmshamen, Germany

Filed Jan. 22, 1970, Ser. No. 4,801
Claims priority, application Germany, Jan. 23, 1969, P 19 03 158.4
Int. Cl. F16d *59/00*
U.S. Cl. 188—184 11 Claims



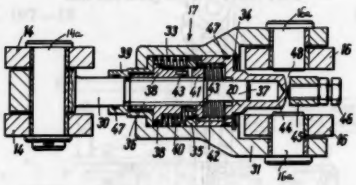
A speed-regulating device for speed-controlled components for precision mechanical application, for example, typewriter carriages, wherein the speed of a rotating shaft is regulated by varying the radial distance from the axis of the shaft of the pivotal bearings for a plurality of centrifically actuated unilaterally mounted brake levers disposed within a brake housing.

3,645,364

SELF-ADJUSTING BRAKING APPARATUS

Alfred Otto, Remscheid; Horst Klassen, St. Sebastian, both of Germany, and Daniel Steiner, Schaffhausen, Switzerland, assignors to Bergische Stahl-Industrie, Remscheid, Germany and Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed June 10, 1969, Ser. No. 831,861
Claims priority, application Germany, June 11, 1968, P 17 50 849.5
Int. Cl. F16d 65/66
U.S. Cl. 188—196 D 19 Claims



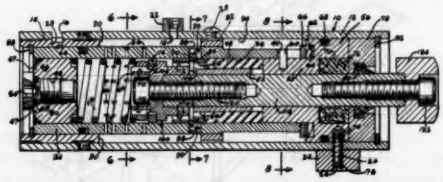
A self-adjusting braking apparatus, particularly for rail-mounted vehicles, comprises two brakeshoes which are movable against opposite sides of a disk by two levers each of which has one end pivotally connected to a shoe. The other end of one of the levers is pivoted to the frame of the vehicle and the other end of the other lever is movable with reference to the other end of the one lever by a braking cylinder. A coupling device of infinitely variable length connects intermediate portions of the two levers so that the levers pivot with reference to the coupling device while the other end of the other lever is subjected to the action of the braking force whereby the shoes move toward the respective sides of the disk. The length of the coupling device is automatically reduced in response to engagement of a projection of the coupling device with an abutment provided on a third lever one end of which is connected to the one end of the other lever and the other end of which is pivoted to the frame. Shortening of the coupling device compensates for wear on linings of the brakeshoes.

3,645,365

ADJUSTABLE SHOCK ABSORBER

John A. Domek, Lombard, Ill., assignor to Efdyn Corporation, Chicago, Ill.

Filed Feb. 26, 1970, Ser. No. 14,285
Int. Cl. F16f 9/44
U.S. Cl. 188—285 5 Claims



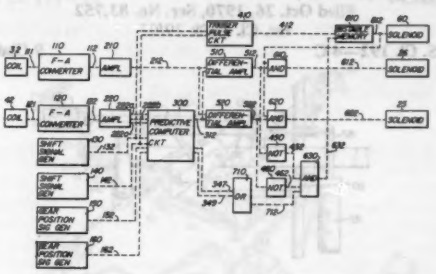
A hydraulic shock absorber including a casing having fluid passageway means, a pressure tube within the casing and having metering ports of various sizes in the wall thereof, and a piston slidable in the pressure tube. The pressure tube is rotatable whereby different ones of the metering ports may be selectively aligned with the fluid passageway means for adjusting the flow of fluid from the pressure tube to the fluid passageway means upon application of impact forces to the piston.

3,645,366

ENGINE SPEED AND CLUTCH SYNCHRONIZING CONTROLS INCLUDING TRANSMISSION CONTROLS

Akio Numazawa, Toyota, and Osamu Ito, Yoyota, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed June 1, 1970, Ser. No. 42,425
Claims priority, application Japan, June 3, 1969, 44/43885
Int. Cl. B60k 21/00
U.S. Cl. 192—.08 10 Claims



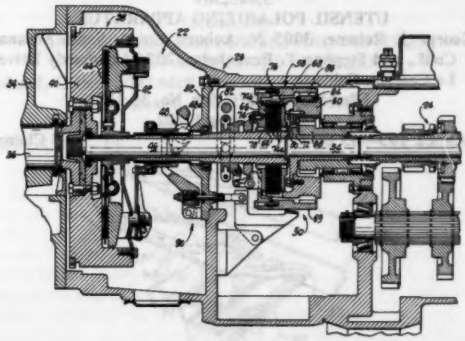
An electronic control system for a clutch located between an engine and a variable ratio transmission includes means to detect the speeds of the input and output clutch shafts, and to control the engine speed before and during gear shifts so that the clutch will engage at synchronous clutch shaft speeds. A special preshift predictive computer means is used in combination with special digital logic circuitry to insure reliable and optimum operation.

3,645,367

OPERATOR FOR CLUTCH AND SYNCHRONIZER BRAKE

William S. Coleman; Michael J. McGraw, and Lowell W. Syverson, all of Minneapolis, Minn., assignors to White Farm Equipment Company

Filed May 25, 1970, Ser. No. 40,109
Int. Cl. F16d 67/02
U.S. Cl. 192—4 A 10 Claims



A transmission for a tractor which includes an engine crankshaft, a transmission input shaft and first and second clutches between the shafts for transmitting power from the engine crankshaft to the transmission input shaft. An inertia brake assembly is supported adjacent the second clutch with a brakeshoe engageable with the drumlike surface of one member of the second clutch. The brake is actuable from the

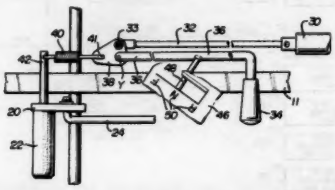
clutch operating pedal for the first clutch when that pedal is depressed beyond a position in which the first clutch is disengaged. The clutch pedal engages the brake with the second clutch to terminate free rotation of the second clutch, the second clutch output member, the transmission input shaft and gearing in the transmission.

3,645,368

BRAKE OPERATED TRANSMISSION NEUTRALIZER

Andrew Blaauw, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 26, 1970, Ser. No. 83,752
Int. Cl. B60k 29/02
U.S. Cl. 192—4 C 9 Claims



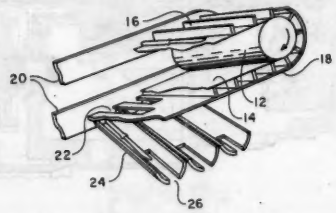
A vehicle which has a transmission having forward and reverse control means in which the forward and reverse control means is connected to a bracket member on the manual control lever to shift the transmission from neutral to forward or reverse; the vehicle is further equipped with a brake mechanism actuated by a pivoted brake pedal which is connected by means of a return spring to the bracket member attached to the control lever; the spring normally tends to constantly urge the control lever in the neutral position; when in tension a lost motion connection is provided between the spring and the bracket member to allow the bracket member to be pivoted by shifting of the direction control lever without loading the spring; the mechanism functions such that, when the brake is applied, the lost motion connection is taken up and the spring is tensioned causing the direction control lever to return to neutral; the spring and the bracket member on the control lever further provides an override means permitting the tractor transmission to be shifted into forward or reverse before the brake is released by stretching the spring to obtain vehicle motion prior to complete brake release.

3,645,369

UTENSIL POLARIZING APPARATUS

George J. Rebane, 3003 N. Auburn Court, Santa Susana, Calif., and Stephen T. Braunheim, 2024 Lombardy Drive, La Canada, Calif.

Filed May 6, 1970, Ser. No. 35,137
Int. Cl. B65g 11/20
U.S. Cl. 193—43 B 3 Claims



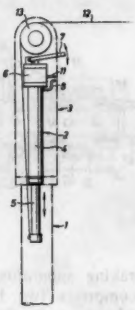
Apparatus for receiving and polarizing utensils that have been sorted as to type. The sorting may be accomplished by passing them over a shield containing sorting slots of increasing lengths through which the utensils drop according to their length. From the sorting slots the utensils pass into the polarizers which automatically turn the utensil so that it will pass handle first into the storage bin.

3,645,370

APPARATUS FOR RAISING AND LOWERING A TENNIS COURT NET

John Rodwell, Hornchurch, and Harry Marsden, Dartford, both of England, assignors to Tennis Unlimited Incorporated, New York, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,607
Claims priority, application Great Britain, Dec. 9, 1968, 58,340/68; Mar. 26, 1969, 15,778/69
Int. Cl. G07f 5/10
U.S. Cl. 194—9 T 16 Claims



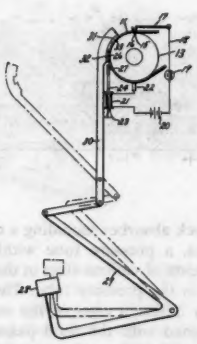
Apparatus for raising and lowering the net of a tennis court which is incorporated in the post supporting the net. The apparatus includes a hydraulically operable ram and cylinder device, the ram of which is connected to the cord of the net so that the net is raised when the ram is extended. The ram is extended by a manually operable pump. A valve biassed to the open position is located so that fluid pumped from a reservoir into the cylinder is returned to the reservoir through the valve. The valve is closed to trap fluid in the cylinder to enable the ram to be extended by insertion of appropriate coin in a coin-operable mechanism. Operation of the coin-operable mechanism starts a timing device which is operative to open the valve at a predetermined time, usually one hour, after the valve has been closed. When the valve is opened the ram retracts under the weight of the net and/or the effect of a spring to cause the net to be lowered.

3,645,371

PRINTING MEANS FOR SORTING AND ROUTING SYSTEM

Arthur Jovis, 1501 Undercliff Ave., Bronx, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,114
Int. Cl. B41j
U.S. Cl. 197—1 4 Claims



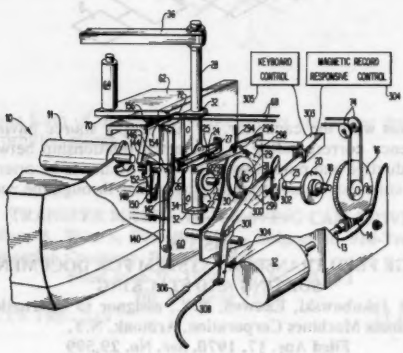
A printing means of a type adapted to simultaneously print ordinary legible indicia and corresponding magnetic ink

characters upon a label in which the activating for magnetic character operation is made by the presence of a label in a particular location upon a platen, whereby an electrical circuit is closed through a predetermined opening in said label.

3,645,372
AUTOMATIC TYPE ELEMENT CHANGING MECHANISM FOR SINGLE ELEMENT TYPEWRITER

Newton G. Noell, and Donald C. Roller, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,453
Int. Cl. B41j *23/04, 1/60, 1/32*
U.S. Cl. 197—18 **6 Claims**

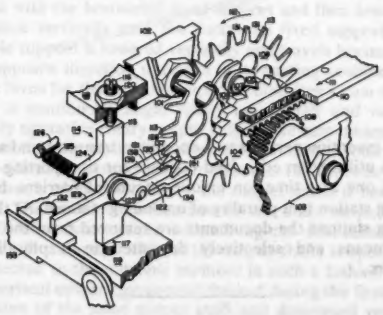


Type element changer mechanism for selectively interchanging type elements on a single element typewriter to provide a plurality of type fonts, selectively changeable under the control of a control unit allowing a typewriter having a memory and/or control unit to print several type fonts without manual changing of the type elements.

3,645,373
ESCAPEMENT MECHANISM

Richard W. Allen, Rochester, N.Y., assignor to The Singer Company

Filed May 21, 1969, Ser. No. 826,539
Int. Cl. B41j *19/00*
U.S. Cl. 197—82 **4 Claims**

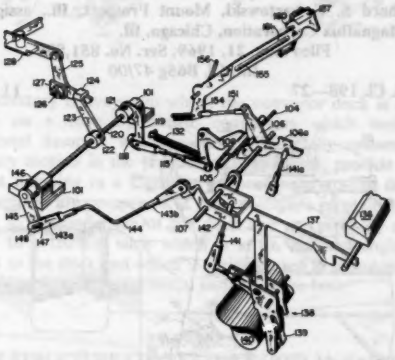


A rigid unitary escapement pawl is provided which has first and second pawl tines which may be alternately engaged with a tooth of an escapement wheel during an escape operation. The unitary structure includes first and second stops which coact with the sides of an escapement wheel to limit the pivotal motion of the structure during an escape cycle of operation. One of the stops provides added rigidity and strength to the associated pawl tine.

3,645,374
ESCAPEMENT-INITIATING MECHANISM FOR TYPEWRITER

Richard W. Allen, Rochester, N.Y., assignor to The Singer Company

Filed Nov. 28, 1969, Ser. No. 880,820
Int. Cl. B41j *19/54*
U.S. Cl. 197—97 **1 Claim**



An escapement mechanism is disclosed which initiates the escapement action at an earlier point in each cycle than prior art devices and which has a reduced tendency to slow the typebar on its way to the printing position. A linkage is provided between the ribbon lift structure and the escapement structure for initiating an escapement by the same action that initiates the ribbon lift and with the power provided directly from the power roll. The invention eliminates the need for the familiar "U-bar." A spring is provided in the throat of the typebar guide for reducing the typebar velocity to an optimum value just prior to impact. The same spring also returns energy to the typebar to accelerate it to its rest position and thereby reduce the elapsed time per cycle of operation.

3,645,375
CONVEYOR SYSTEM FOR MOVING FIXTURES THROUGH A SELECTED PROGRAM

John R. Gelzer, 3042 McKinley Ave., Columbus, Ohio

Filed Dec. 4, 1969, Ser. No. 882,029
Int. Cl. B23q *7/00*
U.S. Cl. 198—19 **12 Claims**

A conveyor system comprising an endless conveyor extending through a predetermined path. Cooperating with this

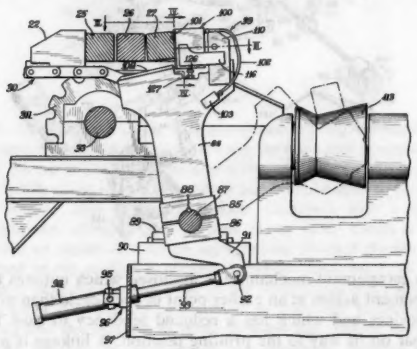
conveyor is an associated guide which along with the conveyor provides a continuous guideway for receiving and guiding fixtures which are adapted to support workpieces that are to be subjected to a certain program of operations. The fixtures are engaged by the conveyor and moved through the guideway at a selected speed, continuously along the greater portion of the guide path, but at the locations where the operations are to be performed, the successive fixtures are caused to stop or dwell for a predetermined period while an operation is performed on the workpieces carried thereby.

3,645,376

BILLET HANDLING SYSTEM INCLUDING MAGNETIC PICKOFF MEANS

Richard S. Gewartowski, Mount Prospect, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed Aug. 21, 1969, Ser. No. 851,809
Int. Cl. B65g *47/00*
U.S. Cl. 198—27 **11 Claims**



Billet-handling system in which a plurality of spaced arms pivotal on a common horizontal axis carry electromagnets having faces engageable with longitudinally spaced portions of a vertical face of a billet on an edge portion of a horizontal support table, the arms being rotatable to move the billet sidewise to a position over receiving rollers which move the billet lengthwise. The magnets are supported on the arms through a pivotal connection which is preferably loose and the arms are independently operated through fluid-operating means, with the magnets being independently movable into firm engagement with the billet even though the billet is twisted or cambered. Each arm is preferably provided with a surface which underlies the billet during the pickoff and transfer operation.

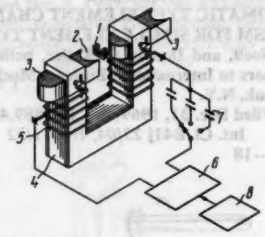
3,645,377

METHOD OF ORIENTATION OF NONMAGNETIC CURRENT-CONDUCTING BODIES MAGNETIC FIELD AND DEVICES FOR CARRYING SAME INTO EFFECT

Bruno Domenikovich Zheigur, ulitsa Miera, 18, kv. 7, Poselok Salaspils Rizhsky raion; Robert Karlovich Kalnin, ulitsa Gorkogo, 53, kv. 19; Benyamin Alexandrovich Ioffe, ulitsa Raunas, 45/2, kv. 81; Alexandr Alexandrovich Shevchenko, ulitsa Suvorova, 23, kv. 4; Vyacheslav Semenovich Dorofeev, ulitsa Frunzes, 11, kv. 5, all of, Riga; Artur Eduardovich Mikelson, ulitsa Miera, 16, kv. 36, Poselok Salaspils Rizhsky raion, and Igor Mikhailovich Kirko, ulitsa Kr. Barona, 78, kv. 1, Riga, all of U.S.S.R.

Filed Dec. 16, 1969, Ser. No. 885,534
Claims priority, application U.S.S.R., Dec. 25, 1968, 1289052; 1289060; 1289062
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AB **14 Claims**

The present invention relates to methods for orientation of current-conducting bodies and devices for carrying into effect the methods. One of such devices comprise an electromagnet having a magnetic core including poles spaced to define an electromagnet having a magnetic core including poles spaced to define an orientation zone, a capacitor, a winding operatively associated with the core and connected



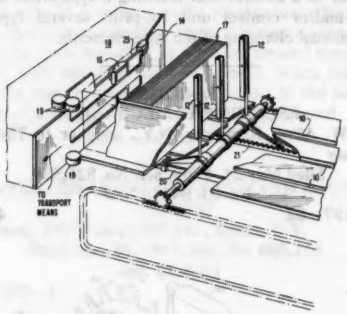
in series with the capacitor, an AC supply source having a frequency corresponding to a selected relationship between the inductive and pure resistance of the bodies to be oriented and a conveyor system to move the bodies through the zone.

3,645,378

EDGE FEED TRANSPORT SYSTEM FOR DOCUMENT SORTING AND STACKING

Marek Jakubowski, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1970, Ser. No. 29,599
Int. Cl. B65g *43/00*
U.S. Cl. 198—38 **11 Claims**



The invention pertains to a document transport and sorting system utilizing an edge feed concept for transporting documents, one at a time, on unique document carriers, from a loading station to a plurality of unloading stations. At the unloading stations the documents are removed from the transport means and selectively deposited in a plurality of stackers.

3,645,379

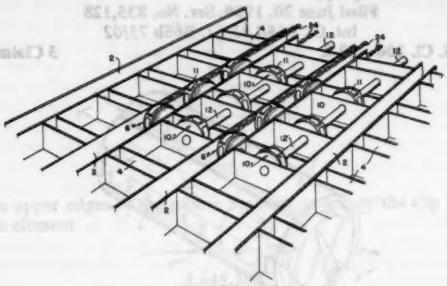
TRANSFER TABLE

Andrew T. Kornylak, 400 Heaton St., Hamilton, Ohio

Filed Apr. 22, 1969, Ser. No. 819,516
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 **6 Claims**

A transfer table for orienting and conveying articles. A network of rollers are mounted to orbit in normally related

planes and to rotate about axes normal to the radius of orbit.



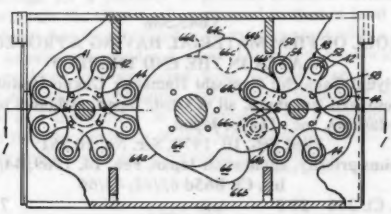
In one form of the invention the rollers are power driven in the orbiting planes.

3,645,380

TRANSFER MECHANISM HAVING CAM DRIVE

William A. Waara, Detroit, Mich., assignor to Visi-Trol Engineering Company, Detroit, Mich.

Filed June 26, 1970, Ser. No. 50,193
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 11 Claims



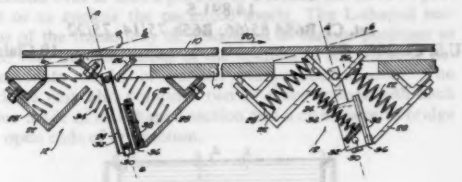
A transfer mechanism having a substantially horizontal fixed support and a movable support adapted to raise vertically a workpiece resting on the horizontal fixed support, move the workpiece a predetermined distance substantially parallel with the horizontal fixed support and then lower the workpiece vertically onto the horizontal fixed support. The movable support is lowered vertically and travels horizontally in an opposite direction to return to its starting position. The motive force for the movable support comprises a cam means having a continuous single rotary input shaft and two alternately operative rotary output shafts. The cam means is so arranged that the input shaft alternately transmits rotary motion to one of the output shafts to produce 180° of rotary motion thereof, while the other of the output shafts is held stationary. The cam means then rotates the other output shaft for 180° of rotation while maintaining the first-mentioned output shaft stationary. One of the output shafts is operatively connected to the movable member in such a fashion as to cause vertical upward movement thereof during the first 180° of rotation of the same output shaft and downward vertical movement during the second 180° of rotation of the same output shaft, while the other output shaft is adapted to cause a horizontal back and forth movement of the movable support intermittent the up and down motion of the movable support respectively during the two alternating 180° rotary motion of the last-mentioned output shaft.

3,645,381

VIBRATORY CONVEYOR

Raimond J. Smiltneek, Butler, Wis., assignor to Logemann Brothers Company, Milwaukee, Wis.

Filed Aug. 12, 1969, Ser. No. 849,326
Int. Cl. B65g *27/00*
U.S. Cl. 198—220 CA 10 Claims



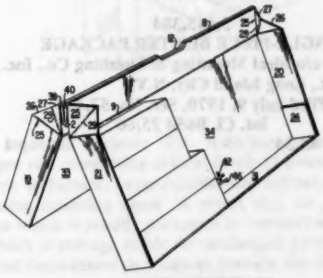
A vibratory conveyor in which the conveyor deck is supported on a base by elastic connectors which include directional dampers which permit substantially undamped vibratory motion in the plane of the deck, yet, provide significant damping in a direction perpendicular to the deck. The dampers are comprised of rods which are pivotally connected to the underside of the deck and are pivotally connected to a friction slide which is at an inclined angle in respect to the deck and which is spring biased in engagement with a complementing frictional surface of the base.

3,645,382

BOX STRUCTURE CONVERTIBLE INTO AN EASEL

Andrew M. Abrams, Spring Valley, N.Y., assignor to Union Camp Corporation, Wayne, N.J.

Filed Oct. 8, 1970, Ser. No. 79,129
Int. Cl. B65d *5/52*
U.S. Cl. 206—45.21 11 Claims



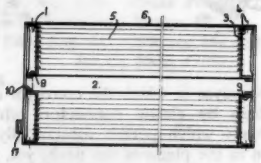
The invention comprises a box in which educational blocks, puzzles, artist material or the like, may be packaged. The box is formed of two nearly symmetrical open halves folded along a center score line in the flat blank from which the box halves are formed. Additional score lines parallel to the fold score line provide hinge lines whereby the two open halves may telescope, to thereby utilize one half as a cover for the other half, or both halves may abut at their open faces to provide a box of maximum volume. The halves may be folded back to a position, wherein an easel or display structure is formed. Securing means are provided to secure the two halves in the easel-forming position. A preferred form of securing means comprises slots in the easel surfaces of the box and a plastic flexible member having rigid transverse rod members at the ends, the rods being dimensioned to fit through the slots, and upon a 90° rotation to engage the easel surfaces and prevent collapse of the same.

3,645,383

SHIPPING UNIT FOR CLOTH LENGTHS HAVING A DELICATE SURFACE PARTICULARLY WOVEN AND KNITTED PLUSHES, VELVETS AND FURNISHING BROCADES

Louis L. Lekane, Brussels, Belgium, assignor to Serasi S.P.R.L., Brussels, France

Filed Mar. 23, 1970, Ser. No. 21,988
Claims priority, application Germany, Mar. 24, 1969, P 19 14 891.5
Int. Cl. B65d *85/66*; B65h *75/14*, *75/22*
U.S. Cl. 206—51 10 Claims



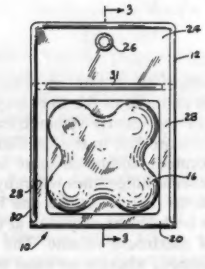
Shipping unit for material lengths having easily damaged surfaces, particularly cloths, characterized by a central tube and two end units (1), cylindrically flat, round or polygonal, made of plastic, cardboard or other substances, of a length equal to the width of the cloth wound in a spiral and fastened by clips (4) on the inside face of the end units (1). These cloth lengths (5) are held at a distance from each other, namely without touching. A cylindrical outer cover (6) either of plastic, paper, cardboard or other substance, is fastened by means of clips (4) on the edges of the rim (14) of the end units (1). Handles (17) are also fastened on these rims (14) in order to carry the whole unit.

3,645,384

SINGLE-PIECE BLISTER PACKAGE

Harold Wind, c/o Ideal Mounting & Finishing Co., Inc. 49-20 Van Dam St., Long Island City, N.Y.

Filed July 9, 1970, Ser. No. 53,410
Int. Cl. B65d *25/00*
U.S. Cl. 206—45.34 1 Claim



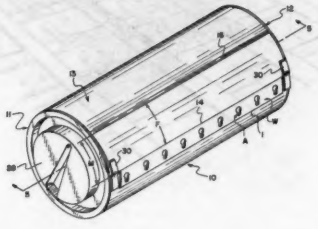
A preformed blister package having a hinged portion integral therewith permitting a lower portion to be rotated about said hinge up against the upper portion thereof in back-to-back relationship providing a fully enclosed package.

3,645,385

OPENABLE CARTRIDGE FOR FACILITATING EGRESS AND INGRESS OF STRIP MATERIAL

Clifford B. Bushnell, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 20, 1969, Ser. No. 835,128
Int. Cl. B65d *85/67*; B65h *75/02*
U.S. Cl. 206—52 R 3 Claims



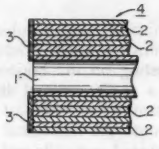
A cartridge for strip material is disclosed which includes a convolution of flexible sheeting wound around spaced, end members. The sidewall sheeting is attached to the end members in a manner providing a movable flap portion which is breakably sealed to an overlapped potion of the sheet convolution. The flap portion is movable to position which facilitates egress and ingress of a strip of web material. One end member is provided with an aperture through which a cartridge core can be connected to rotary drive and the other end member is provided with a surface construction adapted for connection to a separate rotary drive by which the entire cartridge can be moved for breaking the cartridge seal.

3,645,386

A ROLL OF FILM MATERIAL HAVING A PROTECTION LAYER IN THE END THEREOF

Moriyuki Takaichi; Naotoshi Hamachi; Gakuo Iwatuka, and Yoshiteru Nakahara, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 10, 1970, Ser. No. 10,261
Claims priority, application Japan, Feb. 14, 1969, 44/12182
Int. Cl. B65d *65/42*, *85/66*
U.S. Cl. 206—59 F 7 Claims



A structure of a roll of a filmy article such as a paper provided with at least one thin resinous layer covering at least one side surface of the roll for protection of the roll from deformation, damage and contamination and a method of making the roll structure.

3,645,387

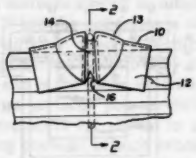
EDGE CLIP FOR PACKAGES

Frederick William Hunt, 5888 Beresford S., South Burnaby, British Columbia, Canada

Filed July 7, 1969, Ser. No. 839,514
Int. Cl. B65d *71/04*
U.S. Cl. 206—60 4 Claims

A clip for a package to prevent the binding element from damaging the edge of the package, said clip comprising an L-shaped clip for fitting over the edge and a groove formed in a

raised portion of the clip to receive the binding element so that as that element is tensioned the clip is deformed to draw

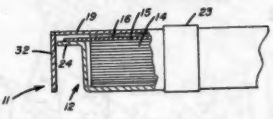


the upper edges of the groove together to secure the clip to the element.

3,645,388
PACKAGE FOR A PLURALITY OF PRESSURE-SENSITIVE SENSITIZED SHEETS

John Rice Fessenden, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1970, Ser. No. 10,881
Int. Cl. B65d *85/00*
U.S. Cl. 206—62 R **4 Claims**

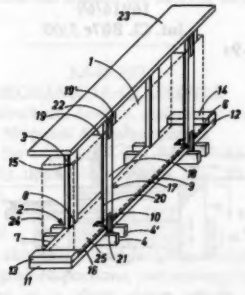


A package for a plurality of pressure-sensitive sensitized sheets wherein the sheets are positioned so that at least one of the sheets has its sensitized surface in contact with a surface of an adjacent sensitized sheet. The sheets are enclosed in the package and protected from abrading against one another by having a springlike pad means compressed in the package and maintained in compression by a plurality of walls so that the tendency of the pad means to expand continuously applies a compressive force to the sheets.

3,645,389
PACKAGING DEVICE FOR SHEET MATERIALS

Marcel Castiaux, Roux, Belgium, assignor to Glaverbel, Watermael-Boitsfort, Belgium

Filed Oct. 29, 1969, Ser. No. 872,149
Claims priority, application Great Britain, Nov. 6, 1968, 52,574/68
Int. Cl. B65d *85/46*
U.S. Cl. 206—62 R **9 Claims**

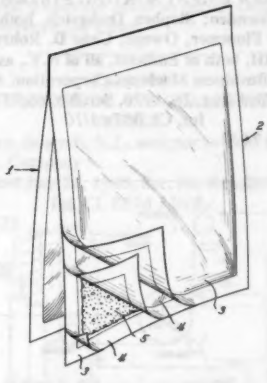


A device is disclosed for packaging a stack or stacks of sheet articles such as sheets of glass. The device comprises a rectangular frame formed of two L-shaped sections and is positioned around a stack of sheet articles. A panel or floor member is disposed between one side of the frame and a face of the stack so that the edges of the sheet articles of the stack rest upon the floor member. On both ends of the floor member there are mounted stops which abut faces of the stack to prevent movement of the stack with respect to the frame. Protective panels may also be mounted on the frame to extend over at least a portion of a face of the stack to protect or to enclose the packaged sheets. The L-shaped sections of the frame may be assembled in various positions so as to vary the dimensions of the opening of the frame to accommodate stacks of various cross-sectional areas. The package may also comprise two or more frames with each frame made of a U-shaped section and a crosspiece to bridge the open ends of this section.

3,645,390
DIAZO COPYING MACHINE ROLL CLEANER PACKAGE

Robert F. Ryan, 640 East Shabonee Trail, Mount Prospect, Ill.

Filed Aug. 7, 1969, Ser. No. 848,330
Int. Cl. B65d *81/32*; **C11d** *7/56*
U.S. Cl. 206—84 **3 Claims**



An aqueous cleaner for restoring synthetic rubber squeegee roll comprising critical levels of anionic surfactant, nonionic surfactant, water-soluble wax solvent, and halogen-containing oxidizing agent. A novel, dry, i.e., free-flowing, mixture which is readily packaged in commercial equipment, and which is storage stable for prolonged periods of time is provided for solution in water to provide the cleaning medium.

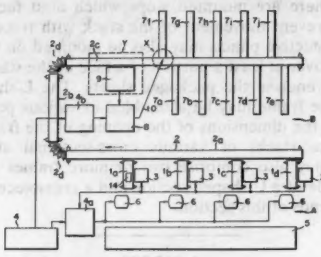
3,645,391
ARTICLE-CLASSIFYING APPARATUS

Hiroshi Hirakawa, Tokyo, and Terumasa Kobayashi, Kanagawa-ken, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 21, 1970, Ser. No. 100,307
Claims priority, application Japan, Dec. 22, 1969, 44/102684
Int. Cl. B07c *3/14*
U.S. Cl. 209—73 **6 Claims**

In an article-classifying apparatus of the type wherein labels formed with classifying patterns are applied onto articles to be classified, the patterns are read and the articles are classified in accordance with signals produced as a result of reading the classifying patterns, there are provided means responsive to article-classifying signals for forming article-classifying patterns on labels, means for applying the labels onto the articles when they are mounted on a first conveyor

route, a second conveyor route for receiving the labeled articles from the first conveyor route, a plurality of gates in the second conveyor route, means for reading the classifying patterns on the labels while the articles are being conveyed by

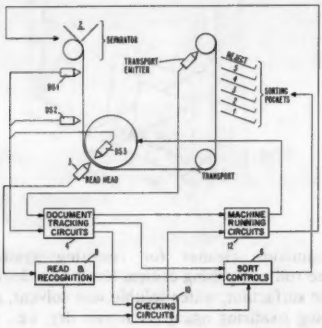


the second conveyor route for generating gate control signals and means responsive to the gate control signals for selectively operating the gates for classifying the articles according to the patterns.

3,645,392
DOCUMENT SORTING SYSTEM

Rudy M. Chittenden; Stephen Deskevich, both of Endicott; Norman R. Plummer, Owego; Gene D. Rohrer, and Louis F. Zaman, III, both of Endicott, all of N.Y., assignors to International Bushiness Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1970, Ser. No. 66,937
Int. Cl. B07c *3/10*
U.S. Cl. 209—74 M **9 Claims**



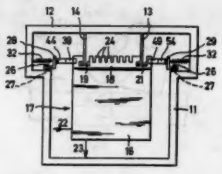
A magnetic ink character reader/sorter having improved means for processing the character signals, storing the pocket selection control signals derived therefrom, and checking the overall operation of the machine. The documents are read by an improved single-gap recognition system, and the sorting information derived therefrom is supplied to a plurality of buffers in accordance with control signals derived from the motion of a document transport.

3,645,393
DEVICE FOR SELECTING INDEX CARDS OF SHEETLIKE FORM

Herbert Weidanz, Odenthal-Globusch, Germany, assignor to Datagraph AG, Zug, Switzerland

Filed Mar. 12, 1970, Ser. No. 18,950
Claims priority, application Germany, Apr. 19, 1969, P 19 19 924.7
Int. Cl. B07c *5/00*
U.S. Cl. 209—80.5 **12 Claims**

A plurality of fingers are arranged at acute angles to both sides of a stack of index cards which are releasably suspended along their upper edges from supporting and guiding rails. The index cards can be selected from the stack, moved to a using station and returned to the end of the stack.

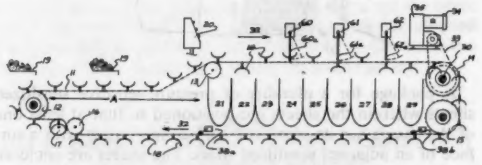


The fingers can be moved into the stack in the direction of movement of the stack so as to divide the stack into smaller individual stacks and to impart a uniform direction of movement to the stack.

3,645,394
APPARATUS FOR SORTING AND GRADING CUT FLOWERS

Richard J. Goodale, Watsonville, Calif., assignor to Goodale Manufacturing Company, Inc., Watsonville, Calif.

Filed Sept. 21, 1970, Ser. No. 73,837
Int. Cl. B07c *1/14*
U.S. Cl. 209—82 **9 Claims**

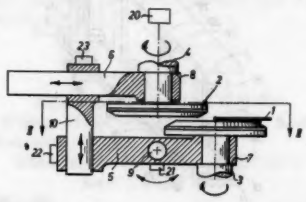


An apparatus for grading cut flowers according to stem length and quality of the flower buds. The cut flowers are placed on trays which are carried by a continuous conveyor past a programming station that is controlled by an operator. The trays are provided with a mechanical device that rides on a track and holds the tray upright until it arrives at the bin into which the cut flower carried by the tray is to be dumped. The quality flowers are graded into several categories depending upon the stem lengths.

3,645,395
APPARATUS FOR SORTING SIMILAR TYPE OBJECTS

Jakob Bosch, St. Gallen, Switzerland, assignor to Heinrich Schmid, vorm. Schmid & Solin, St. Gallen, Switzerland

Filed Nov. 6, 1970, Ser. No. 87,403
Claims priority, application Switzerland, Nov. 13, 1969, 16916/69
Int. Cl. B07c *5/00*
U.S. Cl. 209—91 **10 Claims**



An apparatus for sorting substantially similar type objects which differ from one another either in terms of the proper-

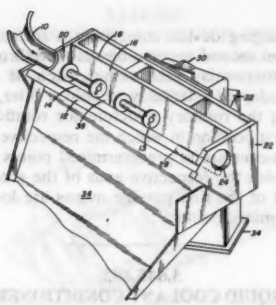
ties of two oppositely situated surfaces of the object or in terms of the spacing of such two surfaces from one another. In order to effectively sort such objects, the inventive apparatus incorporates two entrainment members possessing object entrainment surfaces spaced in substantial parallelism from one another. When the apparatus is utilized for sorting objects possessing different spacing of such surfaces, then, the entrainment members can be movably driven in the same sense or direction, and in the other situation where there are sorted objects whose surfaces possess different properties, such entrainment members are driven in a manner that at least the overlapping portions of such entrainment members are moved in a respective opposite sense or direction with respect to one another.

3,645,396

SPOOLING GAUGE AND REJECT SYSTEM

Frederick W. Reiss, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,846
Int. Cl. B07b *13/06*
U.S. Cl. 209—97 6 Claims



Apparatus and method for separating spool-shaped articles having defective flanges from similar articles which are substantially free from flange defects includes translating the articles in an axial direction over an opening of predetermined width less than the flange diameter between members supporting the article by contact at the flange perimeter, and rotating the articles about the core axis so that the articles with defective flanges are rotated into a position in which the flange dimension is insufficient for the flanges to support the articles. The defective articles thereby fall through the opening whereas the articles substantially free from flange defects will not. The apparatus desirably includes track means which defines the opening, supply means for supplying the articles to the track for travel in an axial direction, and means, advantageously vibrational means, for moving and rotating the articles.

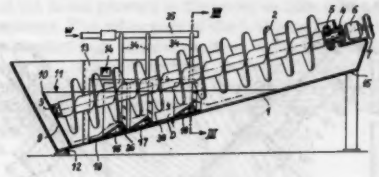
3,645,397

MECHANICAL CLASSIFIER

Viktor Weiss, Radentheln, Austria, assignor to Osterreichisch-Amerikanische Magnesit Aktiengesellshaft

Filed Nov. 18, 1969, Ser. No. 877,613
Claims priority, application Austria, Nov. 20, 1968, A 11275/68
Int. Cl. B03b *3/32*
U.S. Cl. 209—464 8 Claims

A mechanical classifier for separating sludge into coarse grained and fine-grained portions, and having a trough with a bottom ascending at a slant above which a conveying mechanism is disposed for advancing the coarse-grained material upwardly along the trough bottom. A weir for overflow of the fine-grained material is located at the deep end of the trough, and a sludge inlet is provided above the level of the weir for introducing the sludge into the trough. Supplementary water is applied to the trough between the sludge inlet and the discharge end of the trough bottom through at least one conduit which extends transversely over the trough bottom and upwardly of the two sidewalls of the trough above the level of the sludge bath established by the weir. The conduit includes a protective shield facing the sludge



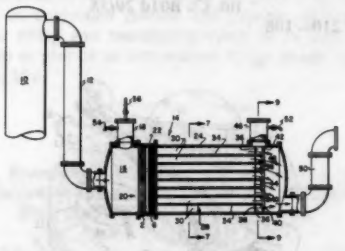
inlet and ascending at a slant toward the trough axis. Supplementary water supplied to the conduit passes therefrom through openings below the bath level preferably formed as slits in the conduit wall facing toward the discharge end of the trough. To increase the separating capability of the classifier, additional conduits may be provided, preferably arranged in spaced transverse zones to permit sedimentation of the materials between the zones.

3,645,398

COALESCER CARTRIDGE AND COALESCER FOR OILY WATER

Robert J. Fiocco, Summit, N.J., assignor to Esso Research and Engineering, Company

Filed July 24, 1969, Ser. No. 844,297
Int. Cl. B01d *21/10*
U.S. Cl. 210—73 10 Claims



A replaceable coalescing cartridge, capable of use in any commercial coalescer, comprising an upstream coalescing section and a downstream bubble breaking section, transforms small diameter oil droplets into larger droplets without the formation of oil surfaced water bubbles. A coalescer, fitted with said cartridge, employing a honeycomb of curve-shaped settling ducts is provided.

3,645,399

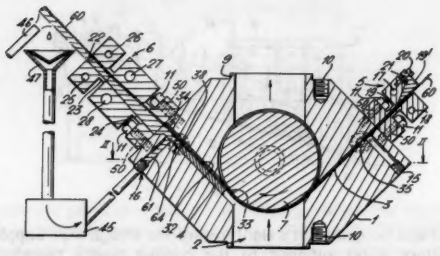
FILTERING PROCESS AND APPARATUS

Peter G. Kalman, 51 Compayne Gardens, London, N.W. 6, England

Filed Sept. 3, 1969, Ser. No. 854,943
Claims priority, application Great Britain, Sept. 3, 1968, 41,915/68; Mar. 25, 1969, 15,667/69; May 13, 1969, 24.416/69
Int. Cl. B01d *29/02*
U.S. Cl. 210—77 31 Claims

A process for filtering a substance flowing through a passageway in which a filter band is introduced across the

passageway through slotted inlet and outlet ports, a sealing substance different from that being filtered is introduced into the ports, temperature conditions are established in the ports such as to cause the sealing substance therein to solidify to form rigid sealing plugs, and, when desired, the filter is moved through the inlet and outlet ports to introduce a fresh part of the filter across the passageway under such conditions



in the ports that the sealing plugs are maintained. Also a filtering apparatus having a passageway through which the substance to be filtered can flow, slotted inlet and outlet ports flanking the passageway through which a filter band is introduced, the ports being cooled so that substance entering them is solidified to form sealing plugs, and a backing support consisting of a rotary drum or an endless train of rollers for supporting the filter band across the passageway.

3,645,400

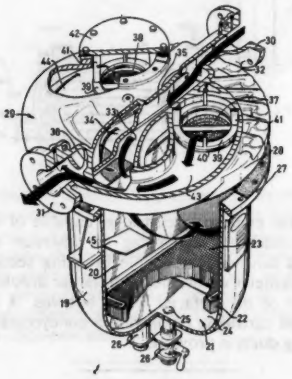
SELF-CLEANING FILTER APPARATUS

Terence John Floyd, 66 Wrottesley Road, Tettenhall, Wolverhampton, Staffordshire, England

Continuation-in-part of application Ser. No. 764,517, Oct. 2, 1968, now abandoned. This application Aug. 28, 1970, Ser. No. 67,782

Int. Cl. B01d *29/38*

U.S. Cl. 210—108 **5 Claims**



In a multiunit filter apparatus for removing solid particulate matter from a flowing fluid, automatic cleaning of the filter units is effected without employing valves and without interrupting the flow of fluid to be filtered, by connecting the filter units in parallel between a common inlet and outlet and forming the inlet as a multistable diverter of the coanda-type which periodically switches the incoming fluid from one filter unit to another and creates a reverse flow of fluid through a filter unit from which the incoming flow has been temporarily switched.

3,645,401

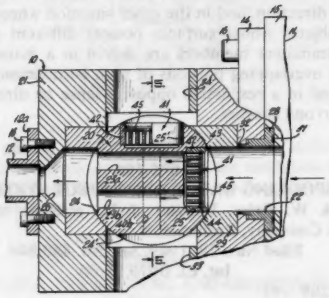
FILTER CHANGING DEVICE

John S. Roberts, Columbia, Md., assignor to Concorde Fibers, Inc., Columbia, Md.

Filed Mar. 6, 1970, Ser. No. 17,283

Int. Cl. B01d *29/02*

U.S. Cl. 210—232 **4 Claims**



A filter changing device comprising a rotatory structure having first and second passage means therethrough in nonparallel, nonintersecting relationship, each of the passage means being adapted releasably to hold a filter, and means for supporting the rotatory structure for rotation about an axis from a first position in which the respective ends of the first passage means are at predetermined points to a second position in which the respective ends of the second passage means instead of the first passage means are located at the same predetermined points.

3,645,402

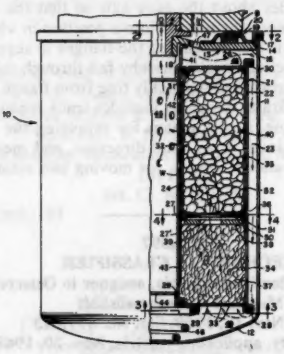
LIQUID COOLANT CONDITIONER

Willis Alexander, Hagerstown, Md., and Robert J. Shaltis, Hastings, Mich., assignors to Mack Trucks, Inc., Allentown, Pa., by said Alexander and Hastings Manufacturing Company, Hastings, Mich., by said Shaltis

Filed Dec. 10, 1970, Ser. No. 96,866

Int. Cl. B01d *25/06*

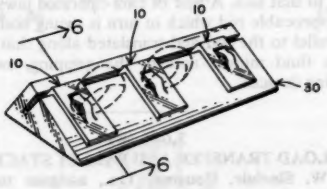
U.S. Cl. 210—266 **42 Claims**



This invention discloses a disposable-type filter particularly adapted for use in the coolant system of internal combustion engines, the filter including a housing having a support plate provided with a central interiorly threaded outlet neck and with inlet passages spaced radially from said neck, a rigid canister provided in said housing in spaced relation from said support plate, a stepped tubular adapter seated over said outlet neck and separating said canister from said support plate.

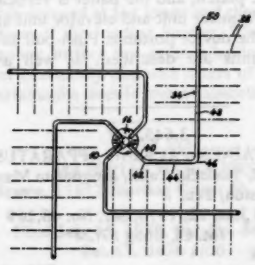
and a spring mounted in said housing pressing said canister and said adapter toward said support plate. In accordance with the invention the canister includes a central tube which is perforated adjacent one end, a perforated bottom end plate, an imperforate top end plate, and an imperforate exterior tubular wall, said end plates being rigidly joined to the exterior and central tubes. The canister is separated into two interior chambers by an annular perforated partition. The bottom chamber is filled with a depth medium of filtering material such as wood wool, rayon fibers, or the like, on top of which rests a cathodic anode disc. The top chamber is provided with a chemical package including ion exchange beads and soluble corrosion prevention chemicals. The flow of liquid within the filter is through the inlet passages into the space between the top of the canister and the support plate, down between the outside of the canister and the housing to the bottom of the housing, upwardly in series through the perforated bottom end plate, the depth filtering media, the anode disc, the transverse partition into the chemical package, radially inwardly from the chemical package through the perforations in the central tube, upwardly through the central tube and thus out of the filter through the outlet neck.

3,645,403
COMBINED RING DISPLAY DEVICE AND CARRIER
Max Walters, 20340 N.E. 20th Ct., North Miami Beach, Fla.
Filed Dec. 9, 1970, Ser. No. 97,437
Int. Cl. A47f *7/00*
U.S. Cl. 211—13 **3 Claims**



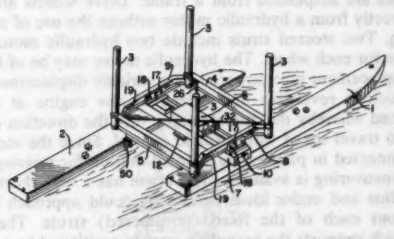
A display device and a carrier therefor adapted to receive and retain a ring thereon for display purposes wherein the ring is received by a resilient tab formed on the display device and held against rotational movement at any desired angle, the display device having a leg portion that is received by a slot formed in an elongated carrier having a triangular cross-sectional shape.

3,645,404
DISPLAY STANDS
Svend Georg Hansen, Tranegardsvej 13 B, 2900 Hellerup, Denmark
Filed Feb. 11, 1970, Ser. No. 10,580
Int. Cl. A47f *5/05, 5/10*
U.S. Cl. 211—168 **11 Claims**



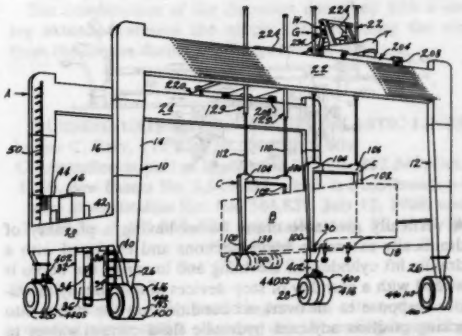
A display stand comprising the following components: (a) an upright (post), (b) a plurality of arms adapted to be mounted on the post, and (c) a substantially hub-shaped connecting member having a central bore for mounting the connecting member on the post coaxially therewith. The connecting member comprises a plane upper surface provided with a plurality of bores arranged coaxially with the central bore and radial grooves in said surface extending from each of the last-mentioned bores towards the central bore, but terminating at a distance therefrom. One end of each of the arms is bent over to provide an L-shaped hook, one part of which is adapted to be embedded in a horizontal position in one of the radial grooves in the upper surface of the connecting member. The other part of the L-shaped hook is adapted to be inserted in a vertical position in the bore adjacent the groove in the connecting member and to extend therethrough, so as to provide for detachably mounting and supporting the arms in a fixed position relatively to the connecting member.

3,645,405
CARGO-HANDLING VESSEL
Nicholas M. Stiglich, Cresskill, N.J., assignor to Eness Research & Development Corp., Westwood, N.J.
Filed Apr. 20, 1970, Ser. No. 30,100
Int. Cl. B66c *23/52*
U.S. Cl. 212—3 **10 Claims**



A vessel of severable hull sections designed to be rotatably severable in controlled fashion and capable of supporting means for lifting and transferring cargo to or from an adjacent ship or pier or an intermittent barge or any combination of the like.

3,645,406
GANTRY CRANES
James W. Brazell, Fulton County, near Atlanta, Ga., assignor to Southern Iron and Equipment Company, Chamblee, Ga.
Filed Oct. 24, 1968, Ser. No. 770,170
Int. Cl. B66c *5/02*
U.S. Cl. 212—14 **12 Claims**



A gantry crane suitable for service in so-called piggyback operations where trailers or containers are handled to and from railroad cars. With a typical capacity of 50 tons the crane can move cargo with its bottom lift grappling arms or

with optional spreader beam for top lift containers. Essentially hydraulic, the crane is self-propelled using a V-8 diesel engine to drive a plurality of hydraulic pumps. All power for load handling and crane movement is transmitted hydraulically. A stepless, reversible hydrostatic drive propels the crane in either direction at typical speeds up to 465 feet per minute. A hydraulic cylinder in each of the grappling arms provides the load-clamping force. Two cylinders are connected to each of the grappling arms for hoisting. A counterbalance valve at each of the hoisting cylinders provides failsafe suspension of the load. Another hydraulic cylinder moves one grappling arm relative to the other so that loads of varying lengths can be handled properly. A stepless reversible hydrostatic drive is incorporated in each of two trolley trucks, which are controlled independently so the operator can rotate the load in a horizontal plane, plus or minus typically 35° from the track centerline and also the operator can move the trolley toward or away from his location. A servo-controlled power steering arrangement, incorporating a conventional Davis steering gear, allows steering about either pair of the nonsteered wheels. An automatic weighing system is incorporated to accurately determine and record the weight of the load simultaneously as the load is being handled. Load cells are used which are transducers that relate tensile force to an electrical signal which can be used to indicate the weight of the load and to print a ticket. The load cells are suspended from a frame. Drive wheels are driven directly from a hydraulic motor without the use of any gearing. Two steered struts include two hydraulic motors each, one for each wheel. The hydraulic motor may be of the fixed displacement type powered by a variable displacement pump which is reversible and driven by the engine at constant speed whereby the operator may vary the direction of travel and travel speed with a single control. Since the motors are connected in parallel, differential motion for steering and or maneuvering is available. The crane has a very short turning radius and under ideal conditions could approach pivoting about each of the fixed (nonsteered) struts. The trolley which supports the grappling arms is positioned by two independently driven trolley trucks that operate along rails mounted on girders. A trolley beam includes inverted rails which ride on double-flanged wheels of a spider assembly. This arrangement allows a variation in truck pivot centers as the trolley displaces the angular relationship and a dashpot at the end limits the travel of the spider and thus a displacement angle.

3,645,407

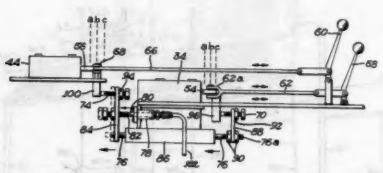
OVERLOAD PROTECTOR FOR CRANE BOOMS

Daniel F. Przybylski, 639 West Lake St., Winona, Minn.

Filed June 15, 1970, Ser. No. 46,224

Int. Cl. B66c *13/48, 23/54*

U.S. Cl. 212—39 R **9 Claims**



A vertically pivotable crane boom having a plurality of hydraulically extensible boom sections and equipped with a hydraulic lift cylinder for elevating and lowering the boom is provided with a plurality of stop devices automatically movable in response to an overload condition on the boom into blocking position adjacent hydraulic fluid control valves to prevent the manual operation of said valves in such a way as to extend the boom sections, lower the boom or hydraulically raise a lift cable on the boom. Hydraulic fluid from the boom lift cylinder is utilized to actuate a fluid motor which shifts the stop devices into said blocking position when the fluid pressure in said lift cylinder reaches a predetermined high level indicative of an overload condition on the boom.

3,645,408

ARTICLE TRANSFER MECHANISM

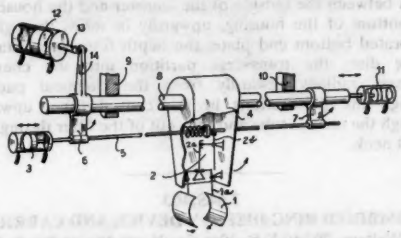
Bruno Bronzini, Turin, Italy, assignor to Fratelli Morando & C.S.p.A., Turin, Italy

Filed June 26, 1970, Ser. No. 50,154

Claims priority, application Italy, Feb. 25, 1970, 67616 A/70

Int. Cl. B66c *1/42*

U.S. Cl. 214—1 BB **2 Claims**



Article transfer mechanism grips and releases articles, swings them about a horizontal axis, and translates them parallel to that axis. A pair of cam-operated jaws is actuated by a reciprocable rod which in turn is swung bodily about an axis parallel to the rod and translated along that axis. Three separate fluid motors actuate the gripping, swinging and translating devices.

3,645,409

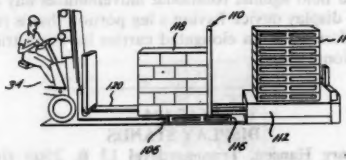
LOAD TRANSFER AND PALLET STACKER

Stuart W. Sinclair, Houston, Tex., assignor to Anderson, Clayton & Co., Houston, Tex.

Filed Mar. 9, 1970, Ser. No. 17,749

Int. Cl. B65g *57/30, 67/04*

U.S. Cl. 214—6 BA **7 Claims**



A load transfer and pallet stacker for use with a platen bearing lift truck, whereby a load is transferred from a pallet directly on to the platen, and the pallet is vertically stacked. A traction plate, transfer unit and elevator unit are interconnected to make the device portable. Push-pull and push only truck-operated units are described, as well as a power-operated unit.

3,645,410

CONTAINER-PACKING APPARATUS

Johnnie L. Powell, Turlock, Calif., assignor to Mandrel Industries, Inc., Houston, Tex.

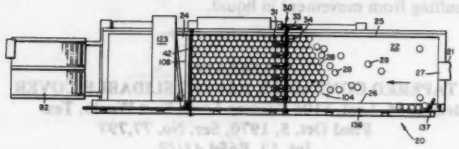
Filed June 22, 1970, Ser. No. 48,269

Int. Cl. B65g *57/24*

U.S. Cl. 214—6 N **12 Claims**

A pallet that is dimensioned for fully supporting a certain number of cans that are packed in layers, and the layers in an even number of staggered diamond pattern rows, is to be

packed with an extra row in each layer. The bottom layer is to be centered on the pallet so that the containers of the edge rows, including the extra row, each overhang beyond the pallet by less than half so as still to be solidly supported. The apparatus accomplishes this packing by moving a set including the extra row of containers along a path above the pallet with



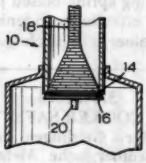
the set preceded by a single row and followed by a remainder to permit the set to separate therefrom; and then removing the preceding row before the set is lowered onto the pallet. The containers of the preceding row are then recirculated to the upstream portion of the path to beome part of a subsequent set.

3,645,411

BLAST FURNACE BELL CONSTRUCTION

Philip Courtenay Kempe, Brighton, South Australia, assignor to Canron Limited, Montreal, Quebec, Canada

Filed May 28, 1970, Ser. No. 41,238
Claims priority, application Canada, Apr. 22, 1970, 80,780
Int. Cl. F27d *3/10*
U.S. Cl. 214—36 17 Claims



An improved bell for blast furnace including arcuate-shaped wear ring segments formed from a laminate consisting of a thick layer of wear-resistant brittle material and a thin layer of ductile material. The outer surface of the wear ring segments is obliquely disposed and the ductile component is disposed below the brittle component. The wear surface of the bell is formed by a plurality of wear rings mounted on a reusable frame by suitable mounting pins. The bell also has a sealing surface formed by a pair of wear ring segments which are releasably secured at the lower end thereof to engage the sealing surface of the loading hopper. The segments which form the sealing surface are again a laminated construction consisting of alternately disposed layers of a brittle wear-resistant material and a ductile impact-absorbing material.

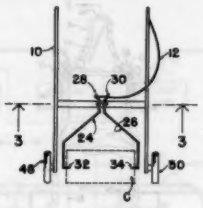
3,645,412

MATERIAL HANDLERS

Lowell N. Brown, 11612 Bowling Green St., St. Louis County, Mo.

Filed July 15, 1970, Ser. No. 54,962
Int. Cl. B62b *1/06*
U.S. Cl. 214—377 1 Claim

This invention relates to a portable Material Handler for use in lifting and carrying about small boxes or crates which are filled with extremely heavy materials utilizing a pair of remotely controlled tongs mounted on a portable lift cart,



pivotally mounted on the cart for forward and backward swinging movement thereon.

3,645,413

MEDICINE DISPENSER WITH NIPPLE-INSERT

Donita L. Mitchell, 2006 Benson Garden Blvd., Omaha, Nebr.

Filed July 10, 1970, Ser. No. 53,876
Int. Cl. A61j *9/04*, *9/08*
U.S. Cl. 215—11 R 5 Claims

A unit-dose medicine dispenser for babies comprising a hollow medicine vial of less than 3 teaspoonsful volume, an annular nipple-insert having an outer wall onto which the nipple is stretched, the inner wall of the nipple-insert being threadedly attached to the vial.

The combination of the dispenser described with a covering extended around the nipple for protecting the nipple from the fingers during attachment to the vial.

3,645,414

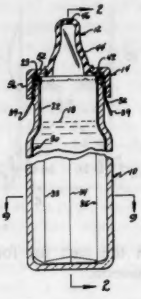
NURSING UNIT WITH IMPROVED PLASTIC LINER

Arthur C. Barr, 111 King St., Madison, Wis.

Continuation-in-part of application Ser. No. 862,840, Oct. 1, 1969, now Patent No. 3,545,637, which is a continuation-in-part of application Ser. No. 744,537, July 12, 1968, now Patent No. 3,471,050. This application Aug. 31, 1970, Ser. No. 68,368
Int. Cl. A61j *9/04*
U.S. Cl. 215—11 R 8 Claims

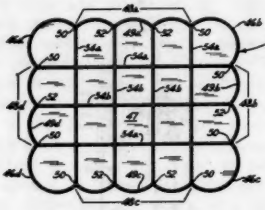
An impervious baby bottle is provided with a plastic liner, a nursing nipple and a retaining cap. A venting insert is provided at the bottle mouth, between the lip and the liner, to vent the area between the bottle and liner to atmosphere so the liner collapses as liquid is dispensed therefrom. The bot-

tle is provided with an annular recess into which the venting insert fits to position and hold the insert at the bottle lip. The



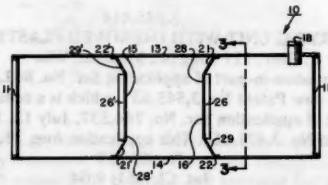
plastic liner is formed of a flattened plastic tube having reentrant folds at the longitudinal sides.

3,645,415
MULTICYLINDER TANKS
Rex V. Phelps, Tulsa, Okla., assignor to Warren Petroleum Corporation, Tulsa, Okla.
Filed Apr. 23, 1970, Ser. No. 31,311
Int. Cl. B65d *1/24*
U.S. Cl. 220—22 **3 Claims**



A tank having an outer wall comprising a plurality of intersecting vertical cylindrical segments joined together at the intersection and arranged with their concave surfaces facing inwardly. Webs joined to junctures of the cylindrical segments and extending across the tank to other junctures carry a part of the outward force applied to the outer wall by liquids stored in the tank.

3,645,416
TANK BAFFLE
Robert Main, Jr., Hutchinson, Kans., assignor to Deluxe Specialties Manufacturing Company, Inc., Hutchinson, Kans.
Filed Sept. 16, 1969, Ser. No. 858,447
Int. Cl. B65d *25/04*
U.S. Cl. 220—22 **6 Claims**

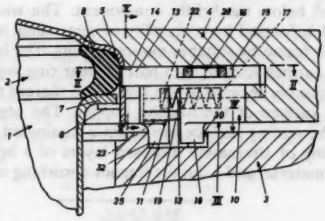


A tank or container for liquid especially adapted to withstand repeated high internal pressure resulting from movement of the liquid therein. One or more pairs of baffles are arranged in parallel within the tank. Each baffle is of a general arch shape preferably having a flat section disposed transversely in said tank perpendicular to the longitudinal axis of the tank with an angular flanged section at both the top and bottom edge. The edges of the flanges are affixed to the tank top and bottom, respectively, leaving the opposite sides free to flex against the tank walls opposing the tendency of the tank to collapse in response to internal pressure forces resulting from movement in liquid.

3,645,417
TAPERED CONTAINER HAVING SLIDABLE COVER
Adelaido M. Leal, 1105 Parsons Lane, Fort Worth, Tex.
Filed Oct. 5, 1970, Ser. No. 77,797
Int. Cl. B65d *43/12*
U.S. Cl. 220—41 **3 Claims**

A container having downwardly converging sides whereby other containers of the same size and shape may be stacked one within the other when the containers are not in use, each container having a slidable cover less than the top width of the container and having spring-biased projections along the sides of the cover for effectively widening the cover area at the top when the container is in its closed position.

3,645,418
PRESSURE COOKER SAFETY DEVICE
Karl-Oskar Oberlander, Geislingen am Steige, Germany, assignor to Wurttembergische Metallwarenfabrik, Geislingen am Steige, Germany
Filed July 14, 1970, Ser. No. 54,705
Claims priority, application Germany, July 17, 1969, P 19 36 505.0
Int. Cl. A47j *27/08*; B65d *45/00*
U.S. Cl. 220—55.3 **21 Claims**



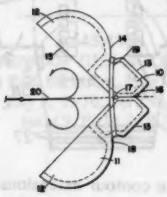
A safety device for a steam pressure cooker has a gasket lifter mechanism for selectively lifting the sealing gasket of the pressure cooker to provide for an escape of steam prior to each opening of the cooker, and preferably also whenever the cooker lid is incorrectly positioned relative to the cooking vessel.

3,645,419

HOOK GUARD AND FLOAT

Nelson Shorrock, R.R. #1, Dryden, Ontario, Canada

Filed Mar. 9, 1970, Ser. No. 17,728
Int. Cl. A01k 97/00; B65d 51/10
U.S. Cl. 220—31 S 1 Claim



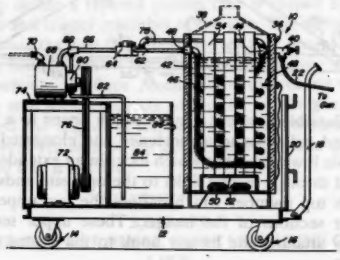
Two substantially hollow spherical portions are normally held closed by a rubberband around the bases of offset manipulative portions. When these portions are pressed together, the two halves open against the pressure of the band so that a fishhook can be inserted or removed from the enclosure. The manipulative portions may be hollow and sealed so that the device can be used as a float also.

3,645,420

HIGH-PRESSURE HOT WATER CLEANER

Joseph G. Machado, P.O. Box 3711, Modesto, Calif.

Filed June 23, 1969, Ser. No. 835,586
Int. Cl. B67d 5/62
U.S. Cl. 222—23 16 Claims



Cleaning apparatus having a tank of hot medium from which heat is transferred to a cleaning fluid conducted through a coiled heat transfer tube. Cold cleaning fluid is delivered by a continuously operative liquid pump to the heat transfer tube from which the heated and pressurized cleaning fluid is delivered to a spray gun having a trigger for initiating an automatic multistage cycle to sequentially spray a surface with water, detergent and a mixture thereof at elevated temperatures.

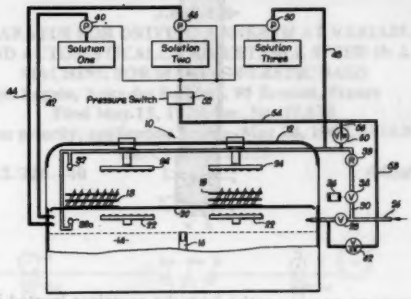
3,645,421

METHOD OF ADDING INGREDIENTS TO A DISHWASHING MEDIUM

John B. Tuthill, Kansas City, Mo., assignor to American Dish Service of Kansas City Inc., Kansas City, Mo.

Filed Feb. 16, 1970, Ser. No. 11,613
Int. Cl. B67d 5/08
U.S. Cl. 222—57 7 Claims

The active ingredients of the rinsing and washing media of a commercial dishwashing machine, which are incompatible in concentrated solutions, are independently introduced into the rinse line and washing medium respectively. The flow of the concentrated solutions of the active ingredients is responsive to a predetermined rise in the pressure of the water being added to the dishwashing medium thereby assuring that



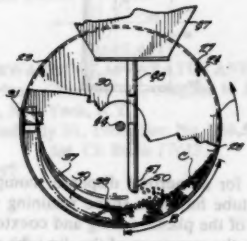
a quantity of each of the active ingredients is added each time water is added in proportion to the quantity of water added.

3,645,422

FEEDER APPARATUS FOR METERING A PREDETERMINED AMOUNT OF PRODUCT

Charles De Witt Cretors, Deerfield, Ill., assignor to C. Cretors & Co., Chicago, Ill.

Filed Mar. 30, 1970, Ser. No. 23,580
Int. Cl. B65d 83/06
U.S. Cl. 222—169 6 Claims



A rotatable feeder apparatus for metering a predetermined amount of product is provided which can be removably mounted on a cooking machine. The apparatus includes a casing which forms a chamber and has an inlet port for receiving a feed tube and a discharge outlet port. An adjustable product volume control is disposed within the casing and forms a measuring area for controlling the amount of product conveyed to the discharge outlet port per revolution of the feeder.

3,645,423

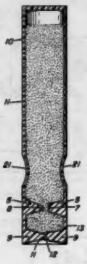
FULCRUM VALVE DISPENSING CONTAINER

William E. DeGraw, Danbury, Conn., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 13, 1970, Ser. No. 19,361
Int. Cl. B65d 37/00
U.S. Cl. 222—207 13 Claims

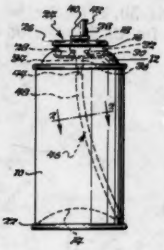
A storage container allows a measured quantity of the free-flowing material to be dispensed. In operation, a fulcrum

valve in the container closes flow of material between storage and dispensing sections wherein the closing valve acts as a



fulcrum to open an outlet from the container located in the dispensing section.

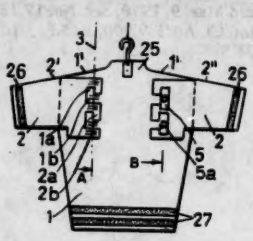
3,645,424
DIP TUBE FOR AEROSOL DISPENSER
Paul E. Gunning, Kenmore, N.Y., assignor to Osmose Wood Preserving Co. of America, Inc., Buffalo, N.Y.
Filed Nov. 6, 1969, Ser. No. 874,530
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.1 2 Claims



A dip tube for an aerosol dispenser comprising an elongated plastic tube having a shape retaining wire embedded into the body of the plastic tubing and coextensive therewith for controlling the curvature of the dip tube and maintaining it in a predetermined orientation. Alternatively, the wire can be inserted within the tube with the opposite ends thereof embedded in the inner wall of the tube or the wire can be provided with loops at opposite ends thereof and applied externally of the tube to stabilize the curvature of the tube.

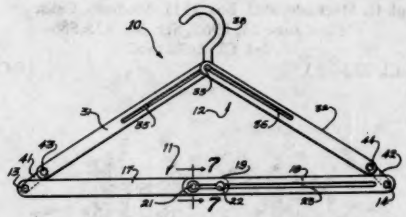
3,645,425
DEVICE FOR THE TENSIONING AND DRYING OF GARMENTS
Anneliese Witzke, Calwer St. 3, Hirsau, Kreis Calw, Germany
Filed Feb. 28, 1969, Ser. No. 803,361
Int. Cl. A41h *5/00*
U.S. Cl. 223—69 13 Claims

A device for the tensioning and drying of garments such as knit goods, particularly in the form of sweaters, pullovers and vests, includes a bust or torso portion conforming to the outline or contour of the body and including shoulder and neck portions of the garment. One or more sleeve-forming or similar attachments are adapted to be engaged through an opening of the garment such as at the sleeve and mounted in a simple manner on the bust portion. The attachments have projecting portions or recesses which interengage with complementary portions of the bust portion to anchor the attachments to the latter portion in adjusted position at which



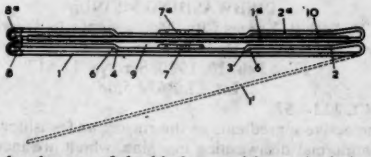
the attachments define contour extensions of the torso portion and provide a proper extension to support, block and tension corresponding parts of the garment to be dried in a stretched and like portion.

3,645,426
COLLAPSIBLE GARMENT HANGER
James T. Glascock, Rt. #1, Cedar Grove, Ind., and Glen R. Schlemmer, 110 Elbern Ave., Harrison, Ohio
Filed May 18, 1970, Ser. No. 38,046
Int. Cl. A47j *51/08*
U.S. Cl. 223—89 9 Claims



A collapsible garment hanger which opens to a triangular shape and collapses to a shortened and elongated shape. A telescopic lower member which locks in an extended position is joined through pivotal links to the opposite ends of an extendable top member which defines the two upper inclined shoulder sections of the hanger. These upper sections are pivotally attaches the hanger hook to the center of the top member.

3,645,427
CLOTHES HANGER
Adriaan Dekker, Dordrecht, Netherlands, assignor to Tomado N V, Dordrecht, Netherlands
Filed Nov. 12, 1969, Ser. No. 875,651
Claims priority, application Germany, Nov. 12, 1968, G 68 06 558.7
Int. Cl. A47j *51/15*
U.S. Cl. 223—96 3 Claims



A clothes hanger of the kind comprising a single length of wire bent back on itself to form two arms extending parallel to each other and adapted to be latched together in the

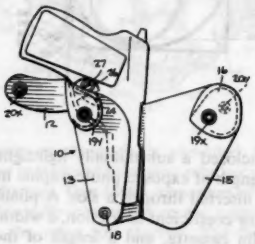
manner of a safety pin with one of said arms having a hanger-suspending hook at its center, the improvement consisting in providing the hook carrying arm with a central offset portion to form a recess for accommodating said hook so that when two of such hangers are hung on a rail closely adjacent to each other the hook on one hanger will not come into contact with a garment hung on an adjacent hanger.

3,645,428

OPEN-TOP GUN HOLSTER

Robert Angell, 514 East 88 Street, New York, N.Y.

Filed July 2, 1970, Ser. No. 52,002
Int. Cl. F41c *33/02*
U.S. Cl. 224—2 B **5 Claims**



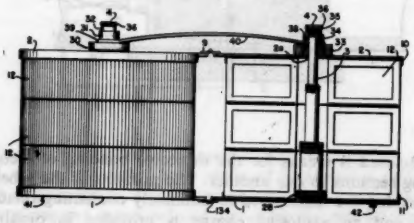
An open-top holster for a handgun whose grip is exposed, the holster affording maximum security for the gun and yet having the capability of being readily unlatched to facilitate a quick draw. The holster is constituted by a central section having first and second flaps on either side thereof, the first flap being folded over the central section and being secured thereto to define a tapered pocket that is shaped to receive the barrel and trigger assembly of the gun. The second flap is foldable over the first flap and is detachably secured thereto by a snap fastener which may be unlatched simply by forcing a finger between the flaps. Anchored on the central section is a locking stud which projects within the trigger guard of the gun behind the trigger to impede movement thereof as well as to prevent removal of the gun from the holster as long as the second flap is latched.

3,645,429

CARRIER FOR CAROUSEL SLIDE MAGAZINE OR THE LIKE

Milton J. Knapp, 1210 North Taft Street, Arlington, Va.

Filed Feb. 4, 1970, Ser. No. 8,500
Int. Cl. B65d *13/00*
U.S. Cl. 224—45 G **15 Claims**



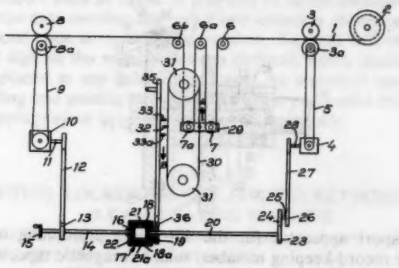
A carrying device, for carousel slide magazines or other articles including a central aperture, comprising first and second planar members in parallel spaced relationship, at least one telescoping connecting member rigidly mounted in perpendicular relation to the first planar member and extending through the central apertures of the said carried articles and through the second planar member, fastening means attaching to the telescoping connecting member to secure the first planar member, the carried articles, and the second planar member in stacked relationship.

3,645,430

APPARATUS FOR DRIVING A SHEATH AT VARIABLE AND AUTOMATICALLY ADJUSTABLE SPEED IN A MACHINE FOR MAKING PLASTIC BAGS

Georges Lagain, 3 rue des Sorbiers, 95 Ermont, France

Filed May 15, 1970, Ser. No. 37,675
Claims priority, application France, May 20, 1969, 6916303
Int. Cl. B65h *23/22*
U.S. Cl. 226—40 **4 Claims**



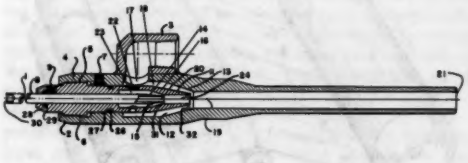
This invention relates to a device for driving a sheath at variable and automatically adjustable speed, characterized in that the members for controlling the speed of the two motor speed regulators are connected respectively by a transmission to two shafts on which are keyed two planetary pinions of a differential, the cage of which carrying the satellite pinions may be rotated during the displacement of a set of free rollers on which the sheath is wound.

3,645,431

YARN-FORWARDING APPARATUS AND PROCESS

David M. Harrison, Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed July 31, 1969, Ser. No. 846,561
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 **11 Claims**



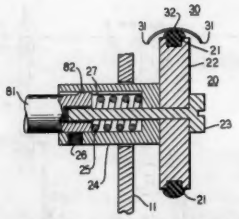
A yarn-forwarding apparatus which comprises a housing having an internal bore passing therethrough. The bore is divided into sections having different diameters which are connected by a converging surface. A hollow element is mounted in the bore of the housing and has an internal bore of different diameters which are connected by a converging surface. The end of the hollow element which is mounted in the bore of the housing is provided with a converging outer surface having less taper than the converging surface of the internal bore of the housing and a first annular converging chamber is formed between the converging surfaces of the housing and the hollow element. A hollow tube is mounted in the bore of the hollow element. The end of the hollow element which is mounted in the bore of said hollow element is

provided with a converging outer surface having less taper than the converging surface of the internal bore of the hollow element and a second converging chamber is formed between the converging surfaces. Inlet means is provided in the housing and the hollow element for introducing a gaseous medium into the first and second converging chambers.

3,645,432
TRANSPORT APPARATUS

John J. French, Wayne, N.J., assignor to Certex, Inc., Fairfield, N.J.

Filed Nov. 19, 1969, Ser. No. 878,089
Int. Cl. B65h *17/20*
U.S. Cl. 226—190 8 Claims



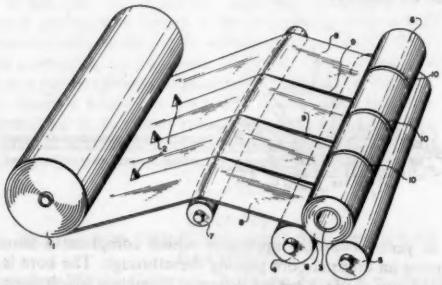
Transport apparatus for the automatic positioning of a flexible record-keeping member, such as magnetic tape, with respect to a transducer, such as a read-write head.

The automatic positioning is achieved by the use of a drive capstan which is narrower than the tape and has a crowned driving face. In addition, the capstan is spring-loaded for adjustment with respect to the read-write head. Tension is applied to the tape by way of standard vacuum columns used in a transport unit.

3,645,433
SPREADER ROLL

Robert G. Lucas, and Kenneth G. Frye, both of Downingtown, Pa., assignors to Corporation Beloit, Beloit, Wis.

Filed Dec. 16, 1967, Ser. No. 885,558
Int. Cl. B65h *17/20*
U.S. Cl. 226—190 4 Claims

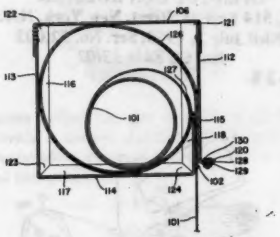


A spreader roll which is useful to spread a slit web into a plurality of separated webs includes an adjustably bowable shaft and a cylindrical outer surface mounted for rotation about the bowable shaft. According to the present invention, the spreader roll is improved by providing an outer cylindrical surface which is made up of a plurality of separate segments axially aligned along the shaft and each segment being freely rotatable about the shaft independently of the other segments.

3,645,434
FILM CASSETTE

Harry Rab, Fairport, N.Y., assignor to The Singer Company

Filed Apr. 27, 1970, Ser. No. 32,012
Int. Cl. B65d *85/67*
U.S. Cl. 226—196 8 Claims

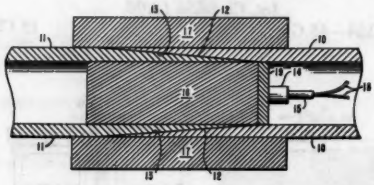


There is disclosed a substantially lighttight film cassette into which a length of exposed photographic medium may be incrementally inserted through a slot. A pliable guide medium having a low coefficient of friction, a width not exceeding that of the film cassette, and a length of the order of the cross-sectional perimeter of the film cassette is attached to the film cassette for guiding and expediting the insertion of the exposed photographic medium. The medium is inserted into the cassette by external advancing means which advance the medium in controlled increments.

3,645,435
MEANS FOR JOINING METALLIC TUBES BY EXPLOSIVE BONDING

Alfred E. Doherty, Jr., Anaheim, and Louis H. Knop, Glendora, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Original application Aug. 19, 1965, Ser. No. 481,023, now Patent No. 3,535,767. Divided and this application July 24, 1969, Ser. No. 871,140
Int. Cl. B23k *21/00*
U.S. Cl. 228—3 4 Claims



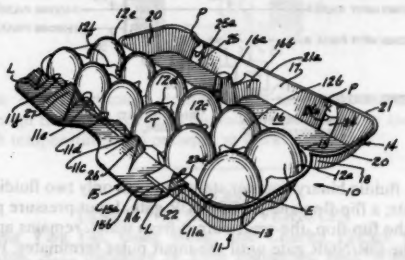
Disclosed is means for the explosive bonding of metallic tubing sections to one another. The portions of the tubes to be bonded are maintained in intimately contacting relationship, and an explosive charge is provided in proximity thereto. This charge, when detonated, creates shock waves which cause the sections to be driven together, creating the bond. Additional axial or circumferential support means may be provided to constrain the tubing sections during bonding. The means for maintaining the intimately contacting relationship may comprise this support means, the explosive charge, or a combination thereof.

3,645,436

CARTON LOCK CONSTRUCTION

James W. Boyd, Crown Point, Ind., and Clifford H. Bessett, South Holland, Ill., assignors to Packaging Corporation of America, Evanston, Ill.

Filed June 3, 1970, Ser. No. 43,089
Int. Cl. B65d 5/66
U.S. Cl. 229—44 R 7 Claims



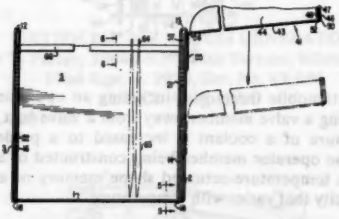
A carton lock construction is provided for releasably securing a cover in a closed overlying relation with respect to the open top of a tray. One lock component of the carton includes a flap hingedly connected to the upper edge of the tray delimiting the open top thereof. The flap, when in a locking position, assumes an upright position disposed in telescoping relation behind a depending wall of the closed cover. The flap is provided at its lateral end limits with substantially flat inwardly projecting locking ledges. The ledges are provided with broad substantially flat surfaces which are located intermediate the flap hinge and the upper elongated edge of the flap. The cover depending wall is provided with a pair of inwardly projecting protuberances which engage the corresponding flap locking ledges and retain the cover in its closed position.

3,645,437

COVERED FILE BOX

Buddy E. Giebel, 328 Tremont Street, Monroe, Mich., and Marilyn F. Reiter, 313 East 78th St., New York, N.Y.

Filed July 17, 1970, Ser. No. 55,705
Int. Cl. B65d 5/66
U.S. Cl. 229—44 R 5 Claims



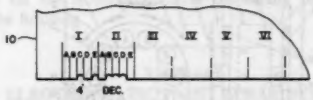
The file primarily for suspended folders comprises a box and a cover therefor, both made of inexpensive material, such as paperstock. The file may be sold in a knockdown kit comprising two prescored and precut blanks, one for the box section and the other for the cover. The cover is attached to the box section by flaps which permit a hinged opening and closing movement and also slidable movement away from the top of the box when it is fully open. Plastic strips are also provided to be placed on the top edges of the sides of the box to facilitate easy sliding movement for the means suspending the folders and other contents within the box.

3,645,438

FLOATING DECIMAL CODING SYSTEM

John L. Lanahan, Whitesboro, N.Y., assignor to Mohawk Industrial Laboratories, Inc., Vernon, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,441
Int. Cl. G06k 1/08
U.S. Cl. 234—1 6 Claims



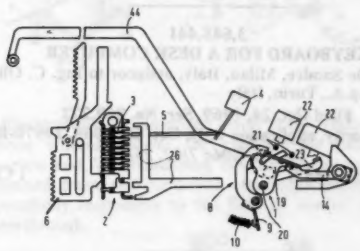
A method and apparatus for coding and selecting data members such as cards. A plurality of series arranged fields on the data member are coded and sensed in sequence with a special code to represent a number, the field following the last digit of the number being a decimal, which decimal can be placed at any field in the series. An electrical circuit for coding and sensing includes a keyboard connected through a stepping switch to coding and sensing solenoids.

3,645,439

MUTUAL LOCKING DEVICE FOR THE KEYBOARD OF A CALCULATING MACHINE

Carlo Bellis, Strambino (Torino), Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Torino, Italy

Filed July 21, 1970, Ser. No. 56,873
Claims priority, application Italy, July 23, 1969, 52763 A/69
Int. Cl. G06c 25/00, 29/00
U.S. Cl. 235—60.49 12 Claims



A mutual locking device establishing a mechanical interrelationship between the numerical keyboard and the operating keyboard of an electric calculating machine for preventing the commencement of an operating cycle initiated before the last of the numerical inputs has been completely entered, including means memorizing the operating input and entering the operating input immediately upon completion of the entry of the numerical input; and preventing the entry of a numerical input initiated while an operating cycle is in progress, including means for memorizing the numerical input and entering the numerical input immediately upon completion of the operating cycle.

3,645,440

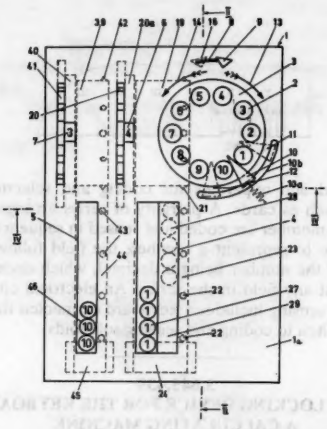
CALCULATING INSTRUMENT

Karola Thevis, Oberndorf/Neckar, Germany, assignor to Schildkrot AG. vorm Rheinische Gummi und Celluloid Fabrik, Mannheim, Germany

Filed July 15, 1969, Ser. No. 841,752
Claims priority, application Germany, July 17, 1968, P 17 72 896.0; Oct. 15, 1968, P 18 03 134.0
Int. Cl. G06c 27/00
U.S. Cl. 235—66 32 Claims

A calculating instrument for use by children wherein a dial disk indexes one of two digit wheels and the one wheel in-

dexes the other wheel. The wheels are mounted in a housing behind windows each of which exposes a single digit on the respective wheel. Each digit on the other wheel represents a numerical value 10 times the value of a digit on the one wheel and the wheels drive endless belts respectively having



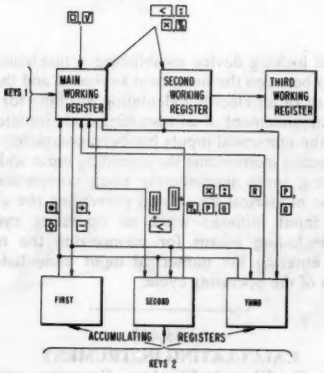
rows of unit symbols and decade symbols. A third digit wheel is indexed in response to successive manipulations of the dial disk when the instrument is set to perform a multiplication or division. The digits of the third wheel represent a series of multiplicands or quotients.

3,645,441

KEYBOARD FOR A DESK COMPUTER

Giovanni De Sandre, Milan, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Turin, Italy

Filed Oct. 24, 1969, Ser. No. 869,272
Claims priority, application Italy, Oct. 28, 1968, 19970-B/68
Int. Cl. G06c 7/02, 25/00
U.S. Cl. 235—145 R 1 Claim



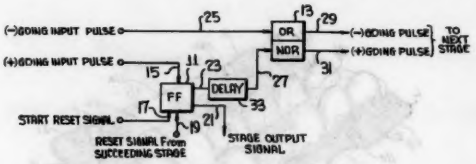
A calculator, including working registers and one or more accumulating registers, is provided with a keyboard including numerical keys, function keys and a connecting key. The connecting key, when operated, connects a selected accumulating register with a predetermined working register controlled by the function keys. The number contained in the selected accumulating register is thereby designated as an operand in the performance of a function selected by the simultaneous or subsequent operation of a function key.

3,645,442

FLUIDIC COUNTER

Peter Bauer, Germantown, Md., assignor to Bowles Engineering Corporation, Silver Spring, Md.

Filed Sept. 16, 1969, Ser. No. 858,322
Int. Cl. G06d 1/08
U.S. Cl. 235—201 17 Claims



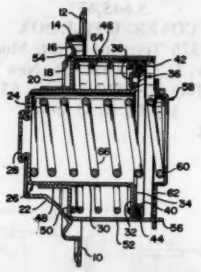
A fluidic binary counter stage requires only two fluidic elements; a flip-flop and an OR/NOR gate. Input pressure pulses set the flip-flop, the reset output from which remains applied to the OR/NOR gate until the input pulse terminates. Pulsed pressure interruptions are applied to the or/NOR gate, the NOR and OR signals from which are delivered to the next counter stage as input pressure and inverted pressure pulses respectively. The counter can count in any base number system by connecting a reset signal to each flip-flop from an appropriate subsequent stage.

3,645,443

AUTOMOBILE THERMOSTAT

James R. Willson, Garden Grove, Calif., and Keith T. Krueger, Bellefontaine, Ohio, assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 19, 1969, Ser. No. 886,668
Int. Cl. F01p 7/16
U.S. Cl. 236—34 9 Claims



An automobile thermostat including an operator member for moving a valve member away from a valve seat when the temperature of a coolant is increased to a predetermined value, the operator member being constructed of a material having a temperature-actuated shape memory or a modulus of elasticity that varies with temperature.

3,645,444

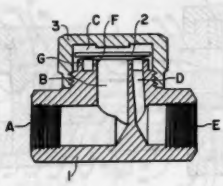
STEAM TRAP OF THE DISC-TYPE

Katsuji Fujiwara, 911 Nishitani, Hiraoka-cho, Kakogawa-shi, Hyogo-ken, Japan

Filed Aug. 12, 1969, Ser. No. 849,435
Int. Cl. F16t 1/04
U.S. Cl. 236—59 8 Claims

This invention relates to a disc-type stream trap, wherein a disc valve is mounted in a chamber defined by a main body and a cover with the main body formed with an inlet port and an outlet port, and having outer and inner annular valve seats, The central portion of the disc valve is made slightly

higher or the inner annular valve seat is made slightly higher than the outer seat so that the valve may maintain its closed



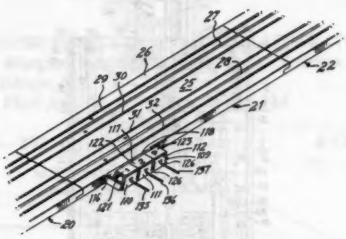
state due to intimate contact with the valve seats, even through the valve becomes curved when exposed to steam at high temperatures and pressure at work.

3,645,445

TRACK FOR MODEL VEHICLES

Cheng Ying Lai, Hong Kong, and Charles Patrick Goins, Atco, N.J., assignors to Tyco Industries, Inc., Woodbury Heights, N.J.

Filed Feb. 18, 1970, Ser. No. 12,254
Int. Cl. A63h *19/30*
U.S. Cl. 238—10 E 3 Claims



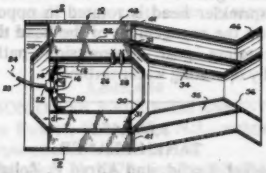
A section of track having conductive rails for sliding engagement with model vehicles, wherein a plurality of wire supports are provided corresponding to respective conductive rails, a wire is supported by each wire support and connected to a respective rail, and holding members are resiliently mounted adjacent to respective wires for releasably holding conductive leads against the wires.

3,645,446

ARTIFICIAL ICE NUCLEI GENERATOR

Bradley T. Patten, 10460 S.W. 44th Terrace, Miami, Fla.

Filed Sept. 4, 1970, Ser. No. 69,694
Int. Cl. A01g *15/00*
U.S. Cl. 239—14 7 Claims



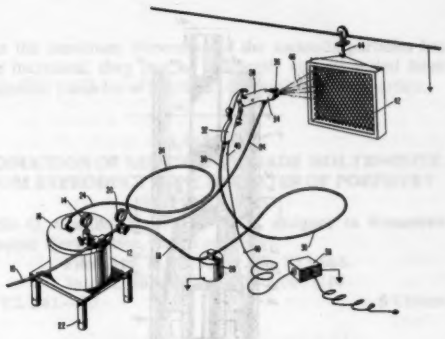
In this generator, a nose cone is mounted in the inlet of a cylindrical combustion chamber. Openings in the cone's surface admit combustion air into the chamber, and slots around the cone's base establish a boundary layer airflow along the chamber wall. A fuel injection nozzle mounted in the apex of the nose cone sprays an acetone solution of a silver iodide-sodium iodide complex into the chamber, where the resulting vapor is ignited. The combustion temperature and hence the vaporization of the complex is controlled by a choke that terminates the combustion chamber. A shell mounted around the combustion chamber ducts preheated air into a heat-insulated, choked chamber where the air quenches the growing nuclei. The resultant dispersion is expanded by a diverging tail portion of the shell. A housing mounted around the shell ducts cool air into the expanding dispersion. A diverging tail portion on the housing deflects outwardly the air flowing along the housing.

3,645,447

ELECTROSTATIC PAINT SPRAY SYSTEM

Philip L. Cowan, Basking Ridge, N.J., assignor to Electrogasdynamics, Inc., Hanover, N.J.

Filed Dec. 31, 1968, Ser. No. 788,148
Int. Cl. B05b *5/00*; F23d *11/28*
U.S. Cl. 239—15 17 Claims



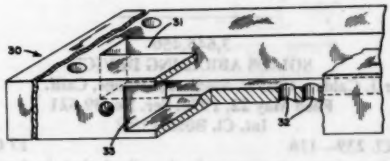
Electrostatic air atomized paint spray system and spray device wherein power for charging air atomized spray droplets and for maintaining electrostatic depositing field is obtained from self-contained electrogasdynamic generator operatively responsive to the flow of seeded atomizing air therethrough.

3,645,448

INLET PLATE FOR A COATING HEAD

Philip H. Houser, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 17, 1969, Ser. No. 877,256
Int. Cl. B05b *5/00*; F23d *11/28*
U.S. Cl. 239—15 5 Claims



In a laminated coating head in which drops of coating material are ejected from relatively small orifices in an orifice plate to provide a patterned coating, as in printing, and a filter plate is positioned upstream of the orifice plate to remove any foreign particles from the coating material and prevent clogging of the orifices, an inlet plate having an elongated slot therein is positioned between the filter plate and the orifice plate to thereby form a chamber between the two

and allow turbulence generated in the coating by its passage through the filter plate to decay before the coating material reaches the orifice plate. Additionally, the inlet plate is provided with a series of passages extending from the slot and concentrically arranged with respect to the orifices to channelize the flow and eliminate cross flow before the coating material is delivered to the orifices.

3,645,449

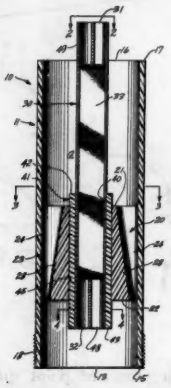
MULTITIER ORNAMENTAL FOUNTAIN

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corp., Burbank, Calif.

Continuation-in-part of application Ser. No. 784,541, Dec. 9, 1968, now Patent No. 3,558,053, which is a continuation-in-part of application Ser. No. 691,111, Dec. 8, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 492,389, Oct. 4, 1965, now abandoned. This application Oct. 5, 1970, Ser. No. 78,117

Int. Cl. B05b *17/08*

U.S. Cl. 239—17 28 Claims



An ornamental fountain nozzle includes an elongate tubular body having a duct formed therethrough between opposite open ends of the body. An elongate plug is disposed across the duct inwardly of the body adjacent its outlet end and has its periphery engaged with the walls of the duct. A plurality of tapered grooves are formed in the sidewalls of the plug at regular intervals around the plug and are inclined in a skew manner to the axis of the duct. A hollow open-ended tube is disposed coaxially of the duct through the plug so that liquid introduced to the inlet end of the body flows through the tapered skew plug grooves to define the lower tier of a fountain discharge pattern and also flows through the central tube to define an upper central tier of the pattern.

3,645,450

SOLIDS ABRADING DEVICE

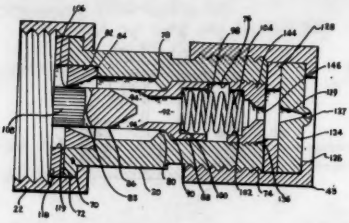
Oliver J. Calder, 1205 E. Madison, Orange, Calif.

Filed May 22, 1970, Ser. No. 39,621

Int. Cl. B05b *15/02*

U.S. Cl. 239—116 17 Claims

Airless spray equipment is described that is free from clogging. The clogging is prevented by passing the liquid, upstream of the spray tip, through anticlogging means comprising a constricted orifice which surrounds a mandrel that has a fluted end and that extends past the orifice entrance. The mandrel is slidably mounted in the orifice with a spring to bias it against movement by fluid pressure. Any solids in the liquid that would clog the spray tip are abraded by the action of the mandrel. In a preferred embodiment, the orifice and mandrel assembly is used with a pole spray extension having a slave valve at its discharge end to eliminate any spitting of liquid. The pole assembly is formed from a plurality of sections that are readily attachable with a threaded male coupling.



3,645,451

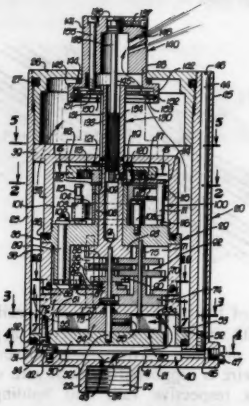
SPRINKLER DEVICE

Fred Hauser, 1544 Midvale Avenue, Los Angeles, Calif.

Filed Aug. 24, 1970, Ser. No. 66,321

Int. Cl. B05b *3/16*

U.S. Cl. 239—206 9 Claims



A water sprinkler device in which a water-operable motor drives a rotatable sprinkler head in an oscillating part-cycle movement so as to discharge water over a selected arcuate sector. The size of such sector may be manually adjusted or selected during operation of the sprinkler. The arcuate sector selected may be manually oriented with respect to the sprinkler device during operation. The radius of the arcuate sector may also be externally adjusted during operation of the device. The device comprises an inner and outer housing, a water turbine, alternate counterrotating gear transmission paths, a reduction gear train, and an overcenter actuating assembly. The sprinkler head is rotated in opposite direction depending upon the engagement of the head through one of the counterrotating gear transmission paths from the unidirectionally operating water turbine.

3,645,452

TANK CLEANER

Albert L. Stoeckel, Euclid, and Alfred F. Zoltai, Elyria, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

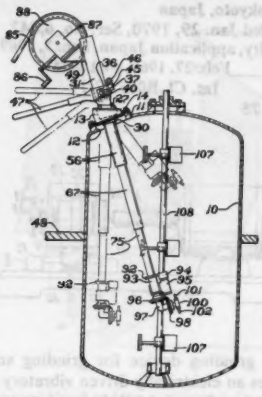
Filed Apr. 27, 1970, Ser. No. 32,290

Int. Cl. B05b *3/02*

U.S. Cl. 239—227 8 Claims

A portable high-pressure tank-cleaning apparatus with telescopic sections adjustably secured to a base section. A

cleaning head is mounted at the end of the forwardmost section and is positioned upon extension of the telescopic sections. The adjustability of the telescopic sections on the base permits the cleaning head to be positioned at different positions in the tank.

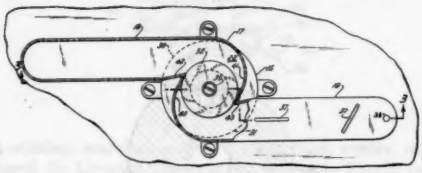


3,645,453

DISHWASHER IMPELLER AND SPRAY APPARATUS

Wendell D. Morgan, Marion, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Aug. 20, 1970, Ser. No. 65,524
Int. Cl. B05b 3/04
U.S. Cl. 239—237 6 Claims



A dishwasher impeller and spray apparatus having a power-driven impeller and a hollow spray arm mounted in substantially the same plane for relative rotation about an axis. A cavity formed in the spray arm contains the impeller and has thrust members formed therein and extending inwardly toward the impeller to divert water into end portions of the spray arm from a path tangential to the periphery of the impeller. The water flowing along the tangential path impinges on the thrust members and exerts a force thereon causing the spray arm to rotate at a rate controlled by water pressure and an angle between the thrust member and the periphery of the impeller.

3,645,454

SEPARATION OF NICKEL FROM ASBESTOS ORE

Richard Payson Fowler, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,443
Int. Cl. B03c 1/30
U.S. Cl. 241—4 10 Claims

The nickel-alloy awaruite found in chrysolite asbestos ore tailings is concentrated by magnetically separating the asbestos ore tailings to obtain a magnetically attracted, nickel-enriched fraction. The nickel-enriched fraction is mechanically impacted, preferably by ball milling, to increase the maximum dimension of the awaruite particles and to fracture the other more easily ground material in the tailings, mainly magnetite and serpentine rock, into smaller particles.

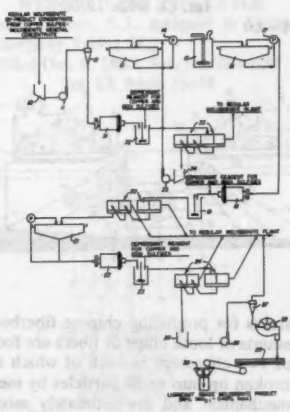
After the maximum dimension of the awaruite particles has been increased, they can be efficiently size-separated from the smaller particles of fractured magnetite and serpentine.

3,645,455

PRODUCTION OF LUBRICANT-GRADE MOLYBDENITE FROM BYPRODUCT CONCENTRATES OF PORPHYRY COPPER ORES

Cecilio O. Castillo, Hurley, N. Mex., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,666
Int. Cl. B02c 1/00; B03d 1/00, 1/14
U.S. Cl. 241—20 5 Claims



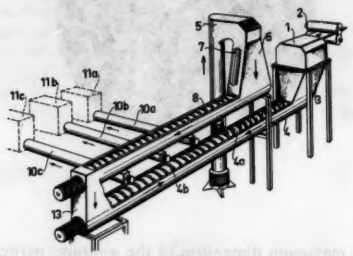
Lubricant-grade molybdenite is produced from byproduct molybdenite flotation concentrates of porphyry copper ores by a sequence of purification steps which include controlled grinding to liberate contaminant minerals and to flatten the molybdenite, followed by a flotation step for the selective recovery of the so-flattened molybdenite. The grinding is controlled to soften impact and minimize duration of the grinding period.

3,645,456

METHOD FOR CONVERTING SHEET CELLULOSE PULP TO DEFIBRATED PULP

Stig Olof Grafstrom, Bondsjo, and Nils Verner Blomqvist, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed June 3, 1969, Ser. No. 830,042
Claims priority, application Sweden, June 5, 1968, 7547/68
Int. Cl. B02b *5/02*; B03b *7/00*
U.S. Cl. 241—29 4 Claims



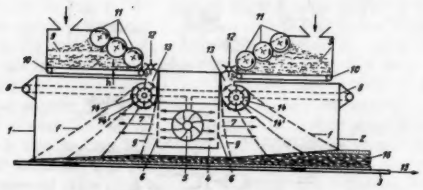
Method and apparatus are provided for converting sheet cellulose pulp to defibrated pulp, uniformity of the defibrated pulp stock being ensured by pooling the shredded pulp obtained from a plurality of cellulose pulp sheets, and uniformly feeding the pooled shredded pulp fibers to the disintegrators.

3,645,457

APPARATUS FOR DEPOSITING COMMINUTED MATERIALS UPON TRAVELING CONVEYING MEANS

Berndt Greten, and Heinrich Mund, both of Springe, Germany, assignors to Bahre-Metallwerk K.G., Springe, Germany

Filed Dec. 8, 1969, Ser. No. 882,916
Claims priority, application Germany, Dec. 20, 1968, P 18 16 212.4
Int. Cl. B02c *19/00*
U.S. Cl. 241—60 4 Claims



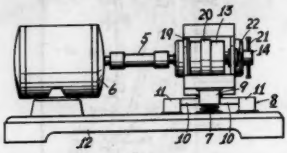
An apparatus for producing chip or fiberboards in which specific amounts of loose chips or fibers are fed continuously into at least two chambers in each of which these chips or fibers are broken up into small particles by means of a comminuting mechanism and are intimately mixed with each other and thrown through substantially horizontally extending dispersing air currents and in the first chamber at different angles in a direction opposite to the direction of travel of a conveyor belt or the like passing through the chambers in a horizontal direction near the bottom of the chambers, and in the following chamber at different angles in the opposite direction, i.e., in the direction of travel of the conveyor belt, so that in the first chamber at first the finest particles are deposited on the belt and thereafter progressively coarser particles upon the finer particles, while in the following chamber at first the coarsest particles and thereafter the progressively finer particles are deposited on the particles which were previously deposited.

3,645,458

VIBRATING GRINDING MILL

Hideharu Tobe, 903-17, 1-banchi, 4 chome, Shimomeguro, Meguroku, Tokyoto, Japan

Filed Jan. 29, 1970, Ser. No. 6,842
Claims priority, application Japan, Feb. 7, 1969, 44/8705; Feb. 27, 1969, 44/16844
Int. Cl. B02c *17/14*
U.S. Cl. 241—175 3 Claims



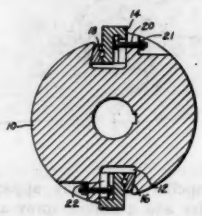
A miniature grinding device for grinding small samples which comprises an electrically driven vibratory structure including an eccentrically weighted shaft, a frame supported on said shaft, one or more cylindrical grinding chambers secured to said frame and an axially aligned free-moving grooved rod or roller in each chamber, each said rod having a size slightly less than the inside volume of each chamber.

3,645,459

ROTOR FOR A ROLL CRUSHER

Robert Lucas, Paris, and Jean-Pierre Millier, Grenoble, both of France, assignors to Fives Lille-Cail, Paris, France

Filed Mar. 2, 1970, Ser. No. 15,630
Claims priority, application France, Feb. 28, 1969, 6905246
Int. Cl. B02c *13/06*
U.S. Cl. 241—191 5 Claims



A peripheral crushing element is held in a dovetailed groove of a rotor by a prismatic wedge member which is interposed between one face of the crushing element and the tapering wall of the groove. The wedge member extends the length of the crushing element and has opposite walls in abutting engagement with the crushing element face and the groove wall, respectively. A key locks the wedge member to the crushing element into a unit for joint movement in an outward direction.

3,645,460

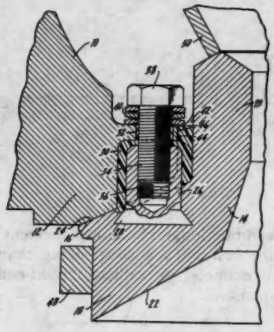
UPPER LINER FOR CRUSHERS

Francis Scaffidi, West Allis, Wis., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Oct. 27, 1969, Ser. No. 869,544
Int. Cl. B02c *2/04*
U.S. Cl. 241—299 9 Claims

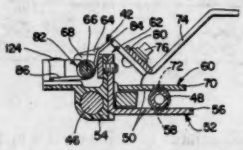
A bowl liner and a bowl for use in gyratory cone crushers in which the body of the liner has improved wear-resistant features and the liner is mounted in a shock-free manner to greatly increase the life of the liner. A circumferential, in-

wardly extending bowl ledge is provided with sockets through which inserts which are fused to the liner body project. The



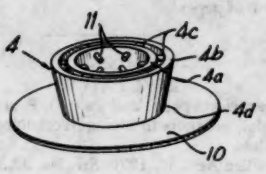
inserts have bores threaded to receive spring-loaded mounting bolts yieldably connecting the liner to the bowl.

3,645,461
WINDING APPARATUS
Robert E. Morton, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.
Filed May 11, 1970, Ser. No. 36,126
Int. Cl. B65h *54/14, 54/36*
U.S. Cl. 242—31 **6 Claims**



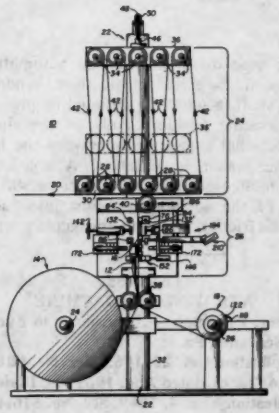
A winding machine, such as a Unifil loom winder, manufactured by Leesona Corporation, Warwick, Rhode Island 02887, has a yarn traversing member releasably threadedly secured to a traverse rod which is reciprocated and rotated to provide a to-and-fro traversing motion and a builder motion to the traversing member and to a yarn advancing through a guide eye of the traversing member as the yarn is wound onto a rotating bobbin. To retain the traversing member operatively threadedly engaged with the traverse rod throughout reversal of the traversing member at relatively high-winding speeds, the traversing member has a pair of threaded jaws releasably held in positive threaded engagement with the traverse rod during winding. In one embodiment the jaws are urged into resilient engagement with the traverse rod in such a manner that should engagement of one of the jaws loosen its threaded engagement with the rod, the other jaw is more firmly threadedly mated with the rod threads. In another embodiment, the jaws are held in operatively fixed relationship with each other when they are operatively threadedly mated with the traverse rod. Upon completion of winding of a bobbin at a predetermined, adjustable position of the traversing member, the jaws are automatically opened to release the traversing member from the traverse rod. A retriever is automatically inserted between the opened jaws and the jaws are then automatically closed onto the retriever and held out of engagement with the traverse rod as a retriever carrier returns the traversing member to its starting point. While en route to the starting point, a cutter is operated to cut the yarn between the traversing member and the filled bobbin which has been doffed. A flap on the retriever carrier clamps the cut end of the yarn from the supply and engages the yarn for winding onto an empty bobbin which has been donned into the winder. The retriever carrier and the cutter are then returned to their original positions and the cycle is completed. Optionally, a tip bunch may be wound on the filled bobbin.

3,645,462
ENDLESS TAPE CARTRIDGE
Fukuzo Ito, and Masaoki Sekine, both of Kanagawa-ken, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed May 28, 1969, Ser. No. 828,498
Claims priority, application Japan, June 11, 1968, 43/40161
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A **3 Claims**



A tape recorder cartridge having a single hub on which a looped endless tape is wound up in a convoluted manner. The hub consists of the main driving wheel for taking up the tape and a driven wheel rotatably mounted on the outer periphery of the main driving wheel with torque transmitting means therebetween. The endless tape is arranged for being wound up on the outer periphery of the driven wheel, pulled out of the innermost convolution of the tape wound up on the driven wheel, and rewound on the outermost convolution on the periphery of the driven wheel.

3,645,463
WEB-SPLICING APPARATUS
Frank R. Helm, Linden, N.J., assignor to Champion Paper Products Company, Union, N.J.
Filed Oct. 6, 1969, Ser. No. 864,037
Int. Cl. B65h *19/18*
U.S. Cl. 242—58.1 **30 Claims**



Apparatus is disclosed for automatically splicing the beginning of one roll of paper or the like onto the approximate end of a second roll of paper or like material without discontinuing the flow of paper to a utilizing device. The ap-

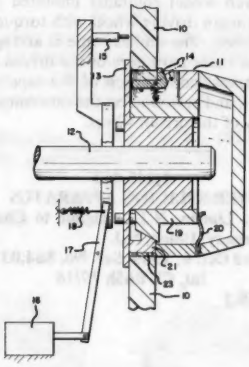
paratus includes a support stand having means for supporting the first and second rolls of paper in rotatable relationship therewith; a festooner arrangement carried by the support stand for establishing an elongated path of travel for paper of the second roll moving through the apparatus and for allowing the utilizing device to feed upon the paper carried by the festooner when the second roll of paper has stopped rotating; and clamping, severing and splicing means responsive to the halt of the second roll of paper for clamping the paper of said second roll at a first predetermined location, severing the paper of said second roll at a second predetermined location, below the first predetermined location, and for joining the beginning of said first roll to the severed end of said second roll; whereby the utilizing device will begin feeding on the paper of the first roll of paper. In addition, there is disclosed preparing apparatus operatively positioned on the support stand for treating the beginning end of the first roll of paper such that it may be subsequently joined to the trailing end of the second roll of paper.

3,645,464

REEL LATCH

Zoltan Herger, Northglenn, and Paul O. Pearson, Longmont, both of Colo., assignors to Storage Technology Corporation, Boulder, Colo.

Filed Apr. 30, 1970, Ser. No. 33,371
Int. Cl. B65h *19/02*
U.S. Cl. 242—68.3 **8 Claims**



A magnetic tape drive unit has an automatic latch for locking a magnetic tape reel to the shaft. When the reel is placed on the shaft, a sensor is actuated by proximity of the reel to its operating position. Pads on the shaft hub are driven into frictional engagement between the hub and the reel when the sensor is actuated. A solenoid actuator operates a combination of cone and cams which translate axial motion of the solenoid actuator into radial motion which drives the friction pads into engagement with the reel.

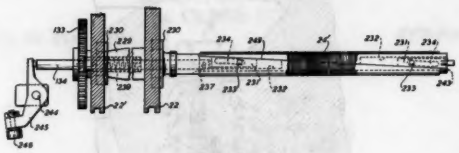
3,645,465

WEB WINDING MACHINE

Walter E. Peery, Princeton, N.J., assignor to Eureka-Carlisle Company, Scranton, Pa.

Original application Oct. 22, 1965, Ser. No. 501,631, now Patent No. 3,462,093, dated Aug. 19, 1969. Divided and this application Mar. 4, 1969, Ser. No. 816,464
Int. Cl. B65h *75/24*
U.S. Cl. 242—72.1 **4 Claims**

A first member supported at one of its ends for rotation and against axial displacement is formed with a uniform outer surface along one of its longitudinal sides and a tapered surface opposite thereto. A second member, formed with a tapered surface on one of its sides and a uniform surface opposite thereto, is disposed with its tapered surface cooperating with the first member's tapered surface. A rod secured to the second member extends through an orifice in the fist



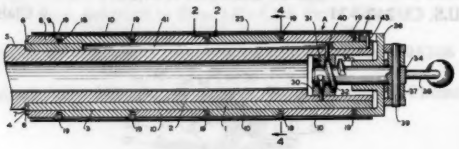
member to facilitate longitudinal displacement of the second member on the first and a corresponding change in the size of the mandrel diameter. A resilient shroud encompasses the length of the mandrel.

3,645,466

EXPANDABLE MANDREL

Harald E. Karlson, Santa Monica, Calif., assignor to Goldsworthy Engineering, Inc.

Filed Aug. 1, 1969, Ser. No. 846,789
Int. Cl. B65h *75/24*
U.S. Cl. 242—72.1 **6 Claims**



The invention relates to a mandrel which is expandable and retractable within definite limits to predetermined diametral sizes and is capable of being disposed upon a central support shaft. The mandrel includes a support tube having a series of longitudinally aligned wedging rings concentrically disposed about said tube, said wedging rings having recesses for accommodating radially expandable cylindrical wedges. Each of the wedging rings is provided with an abutment at one end for engaging the wedges and arresting the innermost limit of travel. Furthermore, the abutments are designed to engage the next adjacent wedging ring, thereby limiting the outermost limit of travel of the wedges. In addition, the support tube is shiftable along the central support shaft by means of a crank handle so that any package formed on the mandrel can easily be removed therefrom.

3,645,467

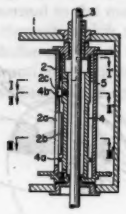
SPOOL FOR CAMERAS

Akihiko Sato, Tokyo, and Minoru Takahashi, Yokohama-shi, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 16, 1969, Ser. No. 885,590
Claims priority, application Japan, Dec. 25, 1968, 43/113220
Int. Cl. B65h *75/28*
U.S. Cl. 242—74.2 **4 Claims**

A spool which can automatically take up a film only by inserting the leading end portion thereof into a film insertion slot of the spool is provided. The spool comprises rotatable outer and inner cylinders, the former having insertion slots while the latter, pawls for engagement with perforations of film and positioned normally in nonalignment with the insertion slots by means of a spring. Upon insertion, the film moves along the inner surface of the outer cylinder and its

perforation automatically engages with the pawl, thereby securely holding the film. Upon rewinding of the film, the



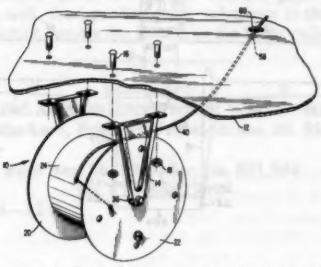
pawls disengage from the perforations since the outer cylinder is held stationary by the film while the inner cylinder rotates.

3,645,468

ANCHOR LINE REEL ASSEMBLY

Alan Y. Edelberg, Fort Worth, and Jimmy E. Hill, Houston, both of Tex., assignors to West Products Corporation, Newark, N.J.

Filed Sept. 8, 1969, Ser. No. 855,901
Int. Cl. B65h *75/48*
U.S. Cl. 242—107 R 2 Claims



A reel for an anchor line is mounted on the underside of a boat deck with the line passing through a deck fitting. Metallic ribbon springs which are unwound from a takeup reel onto an output reel during the laying of the anchor cause the line to be rewound rather than accumulate on the deck during manual raising of the anchor. Line guides positioned on the reel supports prevent the line from fouling.

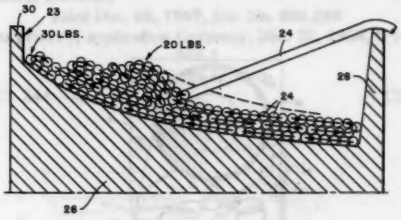
3,645,469

NONROTATING SPOOL WITH OPTIMUM WIRE TENSION UPON PAYOUT

Edward G. Fischer, Verona, and Albert J. Molnar, Trafford, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 24, 1969, Ser. No. 869,032
Int. Cl. B65h *75/14, 49/02*
U.S. Cl. 242—118.4 3 Claims

An improvement to minimize payout tension of a wire on a nonrotating spool wherein the spool has a drum portion between inboard and outboard flanges, the improvement comprising the drum having outside diameters which progressively increase from the inboard end to the outboard end according to a desired maximum constant tension contour, and the wire being wound on the drum to form outside



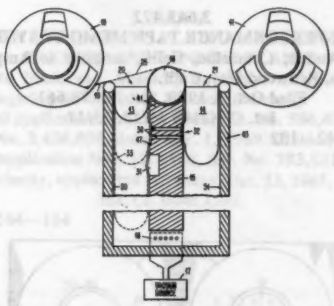
diameters which progressively increase from the inboard end to the outboard according to a desired minimum constant tension contour.

3,645,470

SELF-VALVING WEB LOADING AND TRANSPORTATION

William H. Dickinson, Boulder, and John W. Irwin, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,815
Int. Cl. G11b *15/58, 15/66*
U.S. Cl. 242—182 7 Claims



In a single capstan two-vacuum chamber web transport, the web (tape) is vacuum urged into the chambers. The web has a tendency to slip over the capstan such that one chamber receives all of the tape to the exclusion of the other. This undesired action is prevented by providing fluid communication means extending between the two chambers with no other fluid communication connections. As the web enters one chamber, it is clamped to the fluid communication means by the vacuum applied through the other chamber. Movement of the web over the capstan is then inhibited, and the web loads into the other chamber. When the web is in both chambers, the fluid communication means is sealed off by the web making it inoperative.

3,645,471

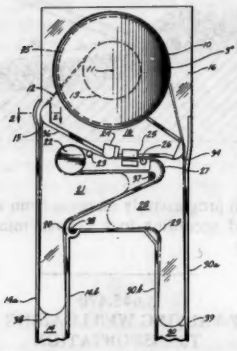
APPARATUS FOR GUIDING TAPE BETWEEN TWO PLANES

Magne Jarle Kjos, Agoura, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 8, 1970, Ser. No. 70,239
Int. Cl. G11b *15/32, 15/58, 23/12*
U.S. Cl. 242—182 13 Claims

Tape on a storage reel is guided to a work plane canted relative to the reel by a tape guide and a vacuum column.

The tape guide has a tape-guiding surface that is perpendicular to the plane of the tape on the reel. The vacuum column



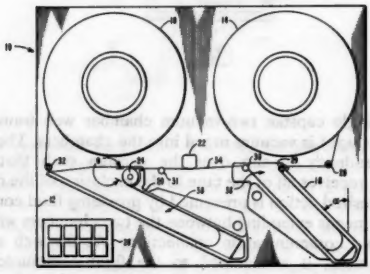
lies in the work plane and has an outer sidewall that coincides with the line of intersection of the two planes. A tape cleaner is placed on or near the tape guide.

3,645,472

HIGH-PERFORMANCE TAPE MEMORY SYSTEM

Azmi S. Audeh, Camarillo, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 7, 1970, Ser. No. 78,661
Int. Cl. G11b *15/58, 23/12*
U.S. Cl. 242—182 **9 Claims**



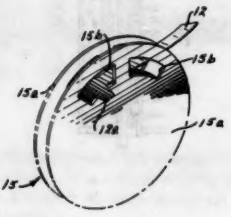
A digital magnetic tape transport utilizes two vacuum storage chambers, a magnetic head and a capstan positioned along a straight-line tape-threading path between a supply reel and a takeup reel. The vacuum chambers are asymmetrically disposed with similar but differing inclinations to provide maximum chamber length as well as a sufficient wrap on the capstan to prevent slippage, while being confined within the outline of a standard mounting rack. Such an arrangement also decreases the number of tape guides while increasing tape stability, avoids frictional contact between the capstan and the oxide surface of the tape, and is particularly suited for automatic and cartridge loading.

3,645,473

TAPE-RETAINING ARRANGEMENT

David Martin Kitch, 660 Fargo Street, Owensboro, Ky.

Filed Oct. 6, 1969, Ser. No. 864,135
Int. Cl. B65h *75/34;* **G03b** *1/04;* **G11b** *15/60*
U.S. Cl. 242—210 **4 Claims**



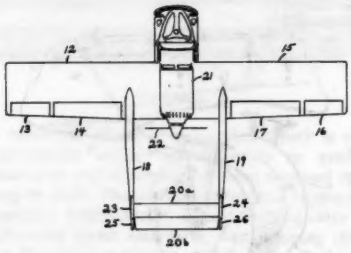
An arrangement for the free end of a rolled tape, such as a magnetic tape, which effectively retains the tape on its spool, and which, at the same time, permits ready withdrawal of the tape, when desired.

3,645,474

COMBINED LAND AND AIR VEHICLE

Samuel H. Arbuse, P.O. Box 244, Palm Beach, Fla.

Filed May 8, 1970, Ser. No. 35,683
Int. Cl. B64c *37/00*
U.S. Cl. 244—2 **10 Claims**



A combined land and air vehicle includes an automobile having an engine for travel on land and a detachable air structure. The automobile is adapted to be connected with the air structure which includes wings, tail assemblies and an airplane engine, for air travel. To become ready to fly, the steering wheel of the automobile is disconnected from the front automobile wheels and is connected with the elevator and aileron controls. A rudder-steering pedal trolley system is engaged, which has pedals that are removed when driving on land and which are connected for flying. A power transmission system permits the automobile engine to rotate the propeller in case of failure of the airplane engine.

3,645,475

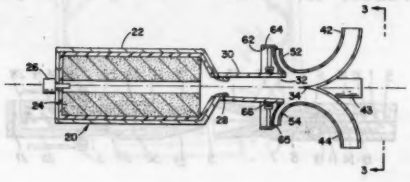
FLUID AMPLIFIER WITH DIRECT-COUPLED GYROCONTROL

William W. Stripling, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 1, 1969, Ser. No. 881,033
Int. Cl. F42b *5/18*
U.S. Cl. 244—3.22 **6 Claims**

A large power-flueric amplifier is controlled by selective restriction of opposing control parts. An inertially stabilized wheel serves to orifice the amplifier control ports to generate

a control moment for directional control of a rocket or missile. A hot gas generator furnishes output gases that exhaust through the fluid amplifier, exiting through opposing exhaust ports around the periphery of the missile to maintain the missile on the original flight path. The inertially stabilized wheel, spinning in a plane normal to the missile flight path, spins on a sleeve or bearing through which the nozzle of the flueric amplifier passes. Tubular members extend radially from the flueric amplifier interaction chamber and terminate adjacent the interior annular surface of the spinning wheel. The wheel



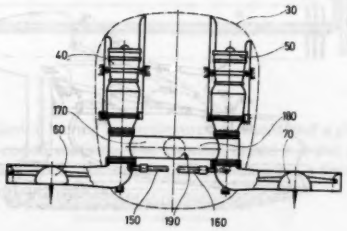
covers a portion of each tube inlet and varies the opening of each control inlet in response to relative motion between the spinning wheel and the missile. Ambient air pressure at each control inlet is constantly applied to uniformly exhausting gases when the missile is aligned with the spinning gyrowheel. Deviation in missile direction results in increased ambient pressure at one control port and decreased pressure at the opposing control port, causing the exhaust gases to move toward one wall, thus, producing an imbalance in the exhaust port gases which restore the missile to the flight path.

3,645,476

LIFT ENGINE ARRANGEMENT FOR V/STOL AIRCRAFT

Erich J. Haberkorn, Friedrich-Frobel-Strasse 40, Riemerling, Germany

Filed Nov. 26, 1969, Ser. No. 881,944
Int. Cl. B64c *29/00*
U.S. Cl. 244—12 B **1 Claim**



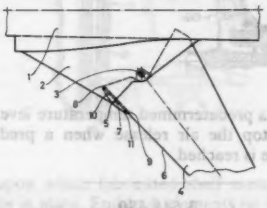
A V/Stol aircraft has jet engines which are mounted vertically in the aircraft and their discharge is conducted directly to a lift-fan associated with each engine. In order to change the position of the fans from an inoperative one within the aircraft to an operative one extending outwardly of the aircraft, they are mounted for rotation about the axis of their respective engine, and the engines may be mounted either rigidly or for rotation about their own axes together with their associated fan.

3,645,477

SWING-WING AIRCRAFT

Herwig Kratschmar, and Gero Otto Madelung, both of Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm, Munich, Germany

Filed Dec. 18, 1969, Ser. No. 886,088
Claims priority, application Germany, Dec. 20, 1968, P 18 16 065.1
Int. Cl. B64c *3/40*
U.S. Cl. 244—46 **7 Claims**



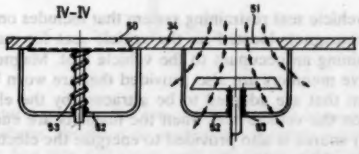
A gap filler for swing-wing aircraft including means for adjustably inserting a plugging member into the gap formed between the movable wing and its fixed support in its movement from one extreme position to the other. Means are provided for coordinating the movement of the gap plugging member with the movement of the movable wing to provide a substantially continuous, smooth leading edge for aerodynamic efficiency.

3,645,478

TAKEOFF AND LANDING PLATFORM FOR VERTICAL TAKEOFF AND LANDING PLANES

Gero Otto Madelung, Munich, Germany, assignor to Entwichlungsring Sued GmbH, Munich, Germany

Original application Oct. 13, 1966, Ser. No. 586,478, now Patent No. 3,436,036, dated Apr. 1, 1969. Divided and this application Nov. 19, 1968, Ser. No. 793,631
Claims priority, application Germany, Dec. 23, 1965, E 30725
Int. Cl. B64f *1/00*
U.S. Cl. 244—114 **9 Claims**



A jet stream dispersion takeoff and landing platform for vertical takeoff and landing airplanes including a flat plate member having an upper jet stream inlet side and a lower jet stream outlet side, supporting legs therefor, the plate member further having a plurality of circular openings therethrough with a downwardly opening circular closure for each of the openings and U-shaped brackets on the outlet side supporting and limiting the downward opening of each circular closure.

3,645,479

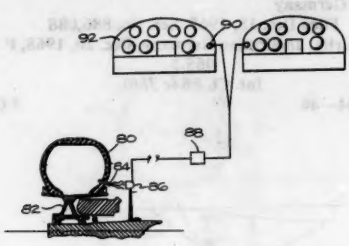
AIRCRAFT TIRE EXPLOSION PREVENTION SYSTEM

Vaclav Kostroun, and Henry H. W. Quenzler, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 16, 1970, Ser. No. 19,603
Int. Cl. B64c *25/36*
U.S. Cl. 244—103 R **6 Claims**

The rotation of each aircraft tire is monitored and compared and when a discrepancy in these rotations shows an

off-synchronized tire rotation, a warning device is activated. In addition, a temperature-sensing valve on each aircraft tire will release the air pressure in the tire and activate the warning device when a predetermined temperature level is sensed and thereafter stop the air release when a predetermined lower air pressure is reached.

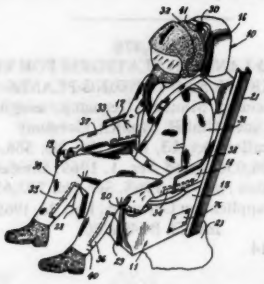


3,645,480

VEHICLE SEAT RESTRAINING SYSTEM

David Forman, Centerport, N.Y., assignor to Fairchild Industries, Inc., Montgomery County, Md.

Filed Apr. 20, 1970, Ser. No. 30,031
Int. Cl. B64d *25/02*
U.S. Cl. 244—122 AG 13 Claims



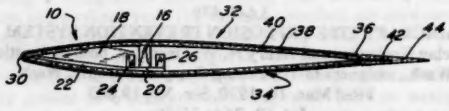
A vehicle seat restraining system that includes one or more electromagnets located on the vehicle seat for magnetically restraining an occupant to the vehicle seat. Magnetically attractive members are also provided that are worn by the occupant that are adapted to be attracted by the electromagnets on the vehicle seat when the magnets are energized. A power source is also provided to energize the electromagnets on the vehicle seat.

3,645,481

AIRFOIL STRUCTURE

Leonard R. Purdy, Oakwood, Ga., assignor to Lanier Industries, Inc., Oakwood, Ga.

Filed Apr. 22, 1970, Ser. No. 30,735
Int. Cl. B64c *3/20*
U.S. Cl. 244—123 11 Claims



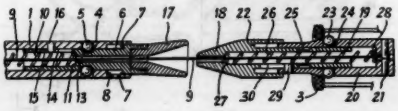
An airfoil structure is disclosed, using a unitary laminated load-bearing skin member, and a rigid internal bracing structure. The skin member includes an outer layer of sheet plastic polymeric material defining the airfoil surface, and an inner rigidifying layer of plastic polymeric foam material bonded to the outer layer.

3,645,482

TOWING DEVICE FOR SLEEVES TOWED BY AN AIRCRAFT

Henri Savarieau, Montgeron, France, assignor to R. Alkan & Cie, Paris, France

Filed Oct. 21, 1970, Ser. No. 82,737
Claims priority, application France, Oct. 29, 1969, 6937184
Int. Cl. B64d *3/00*
U.S. Cl. 244—137 3 Claims



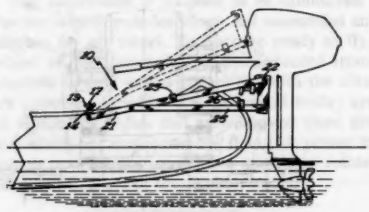
The sleeve exchange device for sleeves towed by an aircraft comprises a hollow external element attached to the end of a towing rope wound by a winch on the towing aircraft. This external element comprises on its outer peripheral surface a single circular set of balls adapted either to project therefrom or to recede in recesses for retaining or releasing rings to which are anchored the launched sleeves. The balls are operated by the movement within the external element of an internal element traversed by the rope. The device comprises also a hollow supporting member rigid with the aircraft and having disposed therearound the rings for anchoring the sleeves to be launched, this supporting member comprising on its outer peripheral surface another circular set of balls adapted to project from or recede into suitable recesses under the control of a guide member adapted to move within the supporting member and to coact with the internal element when the rope is wound.

3,645,483

MOTOR-MOUNTING DEVICE FOR CANOES

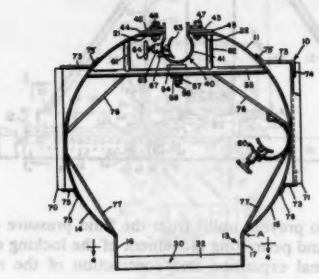
Carleton E. Bartosch, and Dorothy E. Bartosch, both of 1815-70th Avenue North, Minneapolis, Minn.

Filed Oct. 30, 1969, Ser. No. 872,523
Int. Cl. B63h *24/26*
U.S. Cl. 248—4 3 Claims



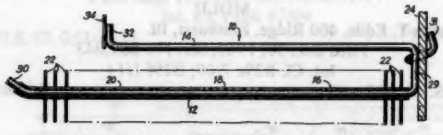
A device for mounting outboard motors to canoes permitting the motor to be positioned directly astern including a reclosable clamp mechanism for clamping the unit to the canoe gunwales and having rearwardly extending arms to a mounting base with intermediate cross arms having contacting portions thereon to contact selected portions of the canoe and prevent lateral movement of the unit relative thereto. The device further provides means for shifting the motor to a position removed from the water.

3,645,484
HOSE HOLDER
Edwin C. Itner, Cass Lake, Minn.
Filed Apr. 27, 1970, Ser. No. 32,200
Int. Cl. F16l *11/14*
U.S. Cl. 248—80 5 Claims



A hose holder for firehose which may be used to hold either the inlet end of the hose when taking water from a pond or which may be used to hold the outlet end of the hose when directing water under pressure to the burning structure and which includes several bases and a hose clamp mounted on a hoop with one of the bases having a platform on which the foot of the user may be stood to hold the hose in discharge position, the hose clamp being angularly adjustable relative to the hoop and bases.

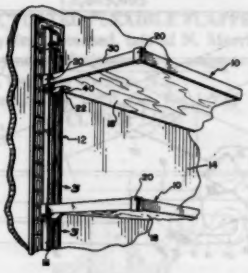
3,645,485
DISPLAY DEVICE
Ronald J. Gold, Spring Valley, N.Y., assignor to S.L.R. Systems, Inc., New York, N.Y.
Filed Jan. 9, 1970, Ser. No. 1,764
Int. Cl. A47f *5/00*
U.S. Cl. 248—223 8 Claims



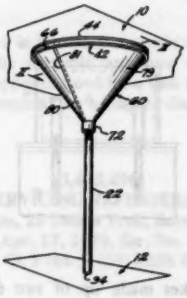
Display device having a cantilevered element and a plurality of color-coded sections. The element forms a lower prong of a U-shaped hook, the upper prong containing a faceplate having identifying indicia.

3,645,486
MODULAR WALL SHELVING
Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, both of Ill., assignors to The Hirsh Company, Skokie, Ill.
Continuation-in-part of application Ser. No. 745,287, July 16, 1968, now Patent No. 3,563,626. This application Feb. 5, 1970, Ser. No. 8,830
Int. Cl. A47b *47/00*
U.S. Cl. 248—243 10 Claims

Modular knockdown shelving having vertical pilasters comprising a baseplate secured to the wall with hook end brackets that slidably interlock with metal channel supports in supporting relation. The channel supports have spaced apertures which receive adjustably located shelf support brackets upon which fabricated shelf members are slipped horizontally in place. End lock elements on the pilasters hold the elements in assembled relationship.



3,645,487
STRUCTURAL MEMBER
David W. Gilchrist, 215 West Water Street, Elmira, N.Y.
Filed Dec. 4, 1969, Ser. No. 881,947
Int. Cl. E04g *25/00*
U.S. Cl. 248—354 S 13 Claims

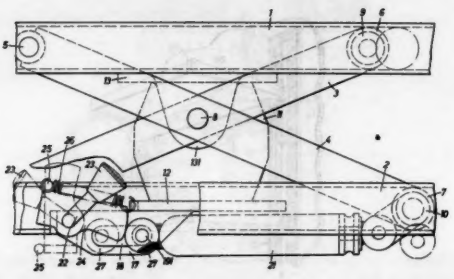


A structural member for removable insertion between two planar surfaces, designed to withstand eccentric loads of a magnitude less than will cause such deflection of its member as to reduce its effective length; the member comprising a column extending between two generally parallel, rigid surfaces arranged at a fixed, constant spacing; at least the upper portion of the column having a rigid structural sleeve of increasing cross-sectional dimension in an upwardly direction, the upper end of which makes positive bearing around its periphery with the upper parallel surface.

3,645,488
VEHICLE SEAT CONSTRUCTION
Klaus Sturhan, Lemgo/Lippe, Germany, assignor to Gebr. Isringhausen, Lemgo/Lippe, Germany
Filed Apr. 10, 1970, Ser. No. 27,264
Claims priority, application Germany, June 21, 1969, G 69 24 745
Int. Cl. F16m *11/00*
U.S. Cl. 248—399 9 Claims

An upper support is upwardly spaced above a lower support and movable towards and away from the same. A connecting means connects the supports with one another with

freedom of movement of the upper support relative to the lower support. First damping means continuously acts upon the upper support for damping movement of the same relative to the lower support. Second damping means is activated at the will of the user for damping movements of the upper support with reference to the lower support in conjunction with and in addition to the action of the first damping means.

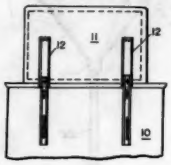


3,645,489

MIRROR BRACKET

Kenneth H. Gutner, 1530 Old Skokie Road, Highland Park, Ill.

Filed Apr. 9, 1970, Ser. No. 26,915
Int. Cl. A47g *1/24*
U.S. Cl. 248—480 **1 Claim**



A mirror bracket made up of two elongated interconnected, pivotally related members, one for attachment to a mirror back and the other for attachment to a dresser back, the dresser element being equipped with novel transversely extending ribs which serve to both reinforce the dresser element while also creating a slight distortion in the dresser element to facilitate immobilization by gripping the dresser back.

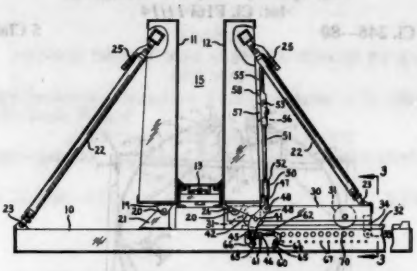
3,645,490

ADJUSTABLE FORM FOR CASTING CONCRETE BEAMS

Robert W. Beasley, Newberg, Oreg., assignor to Ted Nelson Company, Portland, Oreg.

Filed Oct. 1, 1970, Ser. No. 77,107
Int. Cl. B28b *7/02*
U.S. Cl. 249—50 **10 Claims**

A plurality of form sections are connected together end-to-end for casting rectangular concrete beams on edge in horizontal position. Each form section is mounted on transverse base beams secured to a concrete foundation or floor. One side form in each form section is mounted on trolleys to roll out on the base beams away from the opposite side form. Provision is made for longitudinal expansion movement of the side forms when they are heated to cure the concrete. Each trolley is equipped with a special locking device to hold the rollout side form in different casting positions for casting beams of different widths. A grooved roller in the locking device engages a bar on a base beam to perform the three functions of locking the trolley against rollout, holding the trolley down to prevent uplift from the fluid pressure of the wet concrete and permitting movement of the locking device with longitudinal expansion and contraction of the rollout side form.



3,645,491

SOLUBLE METAL CASTING CORES COMPRISING A WATER-SOLUBLE SALT AND A SYNTHETIC RESIN

Warwick N. Brown, and Peter M. Robinson, both of Birmingham, England, assignors to Aeroplane and Motor Aluminum Castings Limited, Birmingham, England

Filed July 22, 1969, Ser. No. 843,774
Int. Cl. B22c *1/22;* **B28b** *7/34;* **C08q** *5/10;* **C08g** *9/10;* **C08q** *51/04*
U.S. Cl. 249—61 **14 Claims**

This invention discloses novel water-soluble cores for use in the casting of metals, and also methods of making such cores. The cores essentially consist of a water-soluble salt and a synthetic resin.

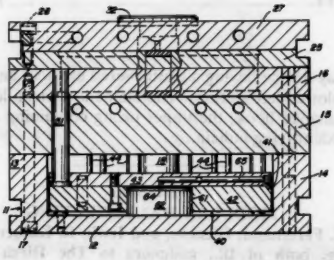
One form of the core consists of a mixture of a water-soluble salt and a liquid synthetic resin binder such as to retain the salt grains in the agglomerate. Another form of the core consists of grains of a water-soluble salt which are coated with a synthetic resin and subsequently dried to a powder.

3,645,492

EJECTION ACTUATOR FOR PLASTIC INJECTION MOLD

Stefan T. Edlis, 400 Ridge, Elmhurst, Ill.

Filed Dec. 30, 1969, Ser. No. 889,043
Int. Cl. B29c *7/00;* **B29f** *1/14*
U.S. Cl. 249—68 **8 Claims**



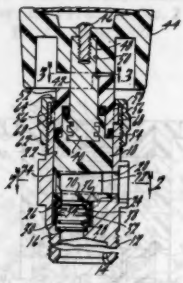
An ejection actuator for a plastic injection mold comprising a cylinder built into the ejector plate of the mold base, a free piston engaging the ejector housing and projecting into the cylinder, and a fluid pressure inlet with a metering orifice for introducing air or other fluid, under pressure, into the cylinder; the complete actuator, other than the fluid source, is located entirely within the mold base.

3,645,493

FAUCET VALVE

Alex Manoogian, Grosse Pointe Farms, and Eric V. Pullen, Northville, both of Mich., assignors to Masco Corporation, Taylor, Mich.

Filed Oct. 12, 1970, Ser. No. 79,908
Int. Cl. F16k 5/04, 5/18
U.S. Cl. 251—120 7 Claims



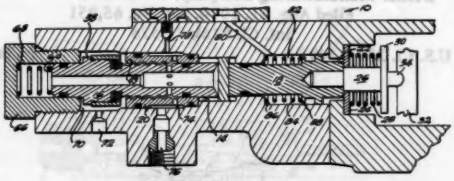
A water faucet comprising a rotatable valving member having a vertically disposed inlet passage in its bottom surface offset from the axis of rotation and movable into and out of registry with an inlet port in the bottom wall of the valve body and having an interior laterally extending discharge passage through which water is discharged to the outlet port in the valve body. The inlet and discharge passages in the valving member are so arranged relative to the inlet and outlet ports in the valve body that when there is only slight communication between the inlet passage and inlet port, the water must flow through a narrow channel defined between the valving member and valve body, rather than directly from the discharge passage to the outlet port, thus creating a back pressure which serves to reduce the noise of operation of the faucet.

3,645,494

VALVE FOR FLUID-ACTUATED BRAKE SYSTEM

William Stelzer, Milford, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 19, 1969, Ser. No. 851,417
Int. Cl. F16k 47/04
U.S. Cl. 251—121 9 Claims



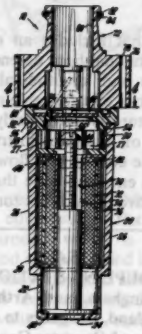
An improved main valve for a fluid-actuated brake system incorporating skid control wherein an elongated passage is provided between an inlet chamber containing high-pressure fluid and an outlet chamber and a movable seal is provided in the inlet chamber for closing one end of the passage. A flanged retainer sleeve is capable of pulling the seal away from the passage when the chambers are to be communicated, and the closely spaced walls of the passage apply frictional forces to the fluid flowing therethrough so as to reduce the velocity of the fluid thereby reducing the problem of erosion and damage to the seal and the valve passage due to the flow of high-velocity fluid. The passage is configured so that the frictional forces applied to the fluid by the passage walls are progressively reduced in response to progressive opening of the valve.

3,645,495

SOLENOID ACTUATED FLEXIBLE FLAPPER VALVE

Julian Robert Aymar, deceased, late of N. Merrick, N.Y. (by Michael R. Aymar, administrator), assignor to Surgical Dynamics Inc., Berkeley Heights, N.J.

Filed Jan. 9, 1970, Ser. No. 1,728
Int. Cl. F16k 31/06
U.S. Cl. 251—129 9 Claims



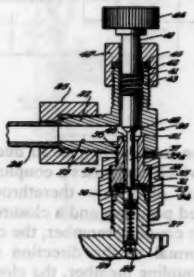
A low-cost valve is provided comprising a molded plastic body in which the movable armature of a solenoid acts against a valve flapper defined by a thin flexible disk. When the solenoid is energized the armature displaces the disk and opens the valve.

3,645,496

DEVICE FOR SERVICING REFRIGERATION SYSTEMS

Clarence C. Rawlins, 25 Indian Trail, Barrington, Ill.

Filed Apr. 17, 1970, Ser. No. 29,614
Int. Cl. F16k 31/50; F25b 45/00
U.S. Cl. 251—148 5 Claims



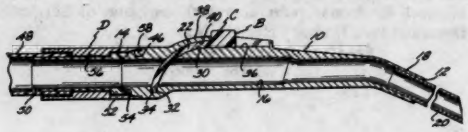
A device for servicing refrigeration systems of refrigerators and air conditioners, which involves the use of a novel coupling facilitating connection of testing or refilling equipment to the liquid refrigerant supply line and the suction line in the system, without escape of refrigerant.

3,645,497

RESILIENT GATE VALVE STRUCTURE

Robert P. Nyboer, 2016 Calle Candela, Fullerton, Calif.

Filed Oct. 14, 1970, Ser. No. 80,536
Int. Cl. F16k 3/28
U.S. Cl. 251—148 8 Claims



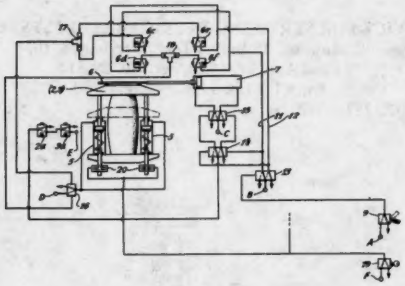
A valve structure that includes an elongate valve body through which a longitudinal bore extends, said structure including a transversely and longitudinally movable resilient valve member for control of a flowable material through said bore. The valve structure is particularly adapted for use in the field of dentistry on aspirator instruments, but may be used equally well in the control of a flowable material from a first zone to a second enclosed zone that is maintained at a negative pressure relative to said first zone.

3,645,498

COUPLING STATION

Arthur Bunting, Gillingham, and Arthur Victor Heighton, Ongar, both of England, assignors to Hall-Thermotank International Limited and Overseas Containers Limited, London, England

Filed Oct. 23, 1969, Ser. No. 868,733
Claims priority, application Great Britain, Oct. 24, 1968, 45,228/68
Int. Cl. F16k 5/14
U.S. Cl. 251—159 8 Claims



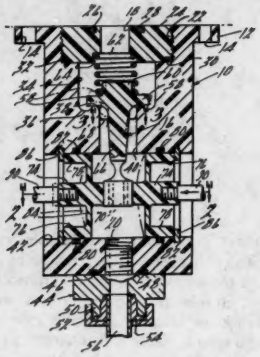
A coupling station for coupling an air duct to an airport of a cargo container which comprises a coupling member movable in the direction of airflow therethrough between extended and retracted positions and a closure plate for sealing the open end of the coupling member, the closure plate moving in a plane normal to the direction of extension and retraction of the coupling member, the closure plate moving in a plane normal to the direction of extension and retraction of the coupling member in a plane located between the extended and retracted positions. The coupling station may be provided with automatic control from a two-position switch which when moved into a first position from a second position retracts the coupling member, then moves the closure plate to the open position and finally extends the coupling member and when moved into the second position from the first position retracts the coupling member, then moves the closure plate into the closed position and finally extends the coupling member.

3,645,499

VALVE STRUCTURE

Shunso F. Watanabe, Livonia, Mich., assignor to Kelsey-Hayes Company

Filed Mar. 23, 1970, Ser. No. 21,759
Int. Cl. F16k 1/16
U.S. Cl. 251—303 8 Claims



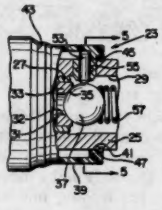
A flow control device comprising a housing formed with a valve chamber including a seat on which a tiltable valve is adapted to be disposed in sealing engagement therewith. A controlled opening of the valve is achieved by an actuator operatively connected to the stem portion of the valve so as to effect a tilting of the head portion thereof relative to the valve seat. The design of the individual components comprising the valve assembly enables their fabrication from plastic materials by modern molding techniques providing a precision valve assembly at a fraction of the cost of similar type valves heretofore known.

3,645,500

THROTTLE SLEEVE FOR FLUID-POWERED DEVICE

Harvey J. Walter, Joppatown, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 21, 1970, Ser. No. 65,951
Int. Cl. F16k 31/528
U.S. Cl. 251—340 7 Claims



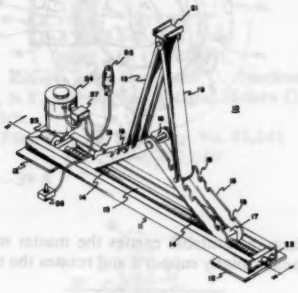
A portable pneumatic device including an elongated housing having a rotary pneumatic motor therein. Pressurized air is delivered to the rear end of the housing to drive the motor

and rotate a tool disposed at the front of the housing. Airflow to the motor is controlled by a throttle valve actuated by a rotatable cam sleeve or collar disposed on the housing. The sleeve is constructed to maximize ease of control of the tool and minimize the possibility of inadvertent or accidental tool operation.

3,645,501
AUTOMOTIVE JACK

Bryan H. Musgrove, 270 East Pennsylvania, Boise, Idaho

Filed Mar. 23, 1970, Ser. No. 21,612
Int. Cl. B66f *3/00*
U.S. Cl. 254—126 **1 Claim**

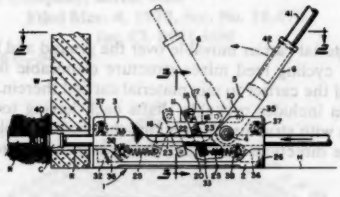


A motor drives a threaded rod having a pair of hinged lever arms connected thereto. A pair of hinged lift arms are carried in notches in the terminal edges of the lever arms to increase the lifting capacity of the jack. The hinged lever arms are caused to be moved inwardly and outwardly in response to rotation of the threaded arm while the hinged terminal ends are simultaneously caused to be moved upwardly and downwardly.

3,645,502
ROD AND PIPE PUSHER AND PULLER

Charles Stromp, Jr., 478 Lake Forest Drive, Bay Village, Ohio

Filed Aug. 8, 1969, Ser. No. 848,437
Int. Cl. E21b *19/00*
U.S. Cl. 254—29 R **8 Claims**

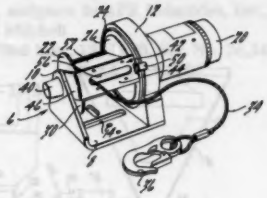


A device for pushing and pulling pipe or rod through the ground having a gripping plate connected to a lever arm mounted for reciprocating movement by swinging movement of the lever arm. An opening is provided in the gripping plate for insertion of the pipe or rod therethrough, and the gripping plate is maintained in tilted position by a spring which may be connected between the bottom of the plate and either end of the pusher and puller frame depending on the desired direction of tilt for pushing or pulling the pipe or rod in either direction.

3,645,503
CABLE CONTROL UNIT

Ralph G. Doerfling, Walled Lake, Mich., assignor to Superwich, Inc., Pomfret, Conn.

Filed Aug. 13, 1970, Ser. No. 63,418
Int. Cl. B66d *1/38*
U.S. Cl. 254—197 **8 Claims**

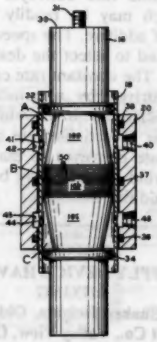


A winch assembly particularly suitable for use in connection with boat trailers comprising a flanged spool having a cable wrapped therearound which is maintained in appropriate helically wound superimposed layers by means of a cable control unit pivotally mounted about the axis of rotation of the spool, which further serves as a safety guard and also prevents an unraveling of the cable from around the spool when tension is removed from the cable.

3,645,504
SONIC DISPERSING APPARATUS

Stanley E. Jacke, Ridgefield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Nov. 22, 1968, Ser. No. 778,274
Int. Cl. B01f *11/02*; B06b *3/00*
U.S. Cl. 259—2 **10 Claims**



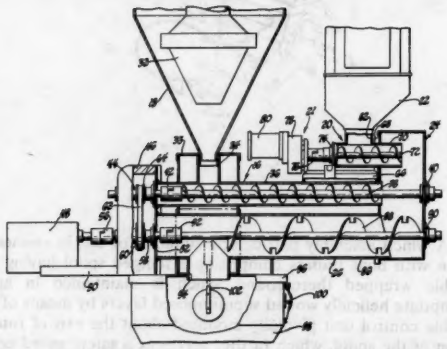
A sonic dispersing apparatus comprises an elongated mechanical transmitting member resonating along its longitudinal axis. An annular sleeve is disposed around the vibrational loop region of said member to form with said member a narrow annular chamber through which liquid to be emulsified is passed.

3,645,505

COLOR BLENDER FOR PLASTIC-PROCESSING MACHINES

John H. McLeod, Jr., Royal Oak, and Robert E. Thoreson, Birmingham, both of Mich., assignors to Thoreson-McCosh, Inc., Troy, Mich.

Filed May 1, 1970, Ser. No. 33,623
Int. Cl. B01f 7/08, 15/04
U.S. Cl. 259—10 **10 Claims**



There is disclosed a color blender for plastic-processing machines of the type which is adapted to be mounted on the machine. The color blender comprises a constant rate screw-type conveyor for the primary material and a variable rate screw-type conveyor for the color additive, both of which have an outlet in a combining chamber. The materials are commingled in the combining chamber and a mixing conveyor thoroughly blends the components and delivers them to a receiver such as a holding hopper on the processing machine. The variable rate conveyor forms a part of a separable unit which may be readily replaced to change colors or the type of additive. The speed of the variable rate supply unit is adjusted to select the desired ratio of additive to primary material. The constant rate conveyor and the mixing conveyor are driven by a constant speed motor in synchronism with each other. In a modification the blender is provided with a pair of variable rate supply units together with the constant rate conveyor so that an additional component such as regrind material may be combined with the primary and color additive materials.

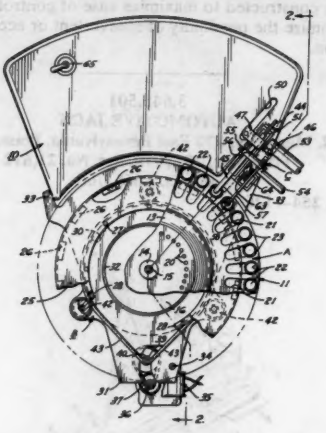
3,645,506

SAMPLING SUPPLY DEVICE HAVING MAGNETIC MIXING

William Selesnick, Shaker Heights, Ohio, assignor to Micro-Metric Instrument Co., Valley View, Ohio

Filed July 30, 1969, Ser. No. 846,040
Int. Cl. B01f 9/10
U.S. Cl. 259—58 **9 Claims**

Process and apparatus adapted to supply sequentially a series of samples, normally liquid, at a sampling station for further processing such as by a conventional analyzer, wherein the samples are stirred or agitated magnetically to maintain them substantially in a homogenous condition. For this purpose, minute dipolar magnets are freely contained in the samples, and the supply device contains recovery means for recapturing the magnets after the samples have passed the sampling station. Dipolar master magnets are passed relatively to the freely-held magnets to induce their rotation. In a



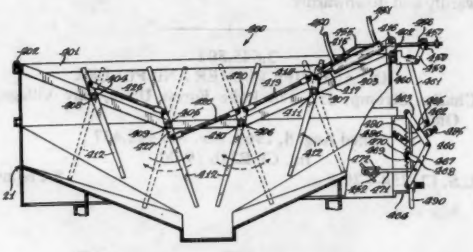
preferred form, a turntable carries the master magnets, and belt drive means jointly supports and rotates the turntable.

3,645,507

FEED MIXER ATTACHMENT

Bert A. Birdsall, Mondamin, Iowa

Original application Aug. 15, 1968, Ser. No. 752,843, now Patent No. 3,572,643. Divided and this application Aug. 10, 1970, Ser. No. 62,394
Int. Cl. B01f 11/04
U.S. Cl. 259—100 **7 Claims**



A material carrier movable over the ground and having automatic cycling feed mixer structure disposable in the container of the carrier to mix material carried therein. This construction includes rockable shafts each having tooth means thereon with structure for rocking the shafts in unison and in opposite directions to reduce forces transmitted to the container.

3,645,508

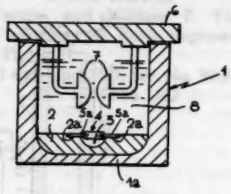
MAGNETIC STIRRER FOR CONDUCTING DIELECTRIC TESTS ON INSULATING OILS

Paul M. C. R. Balteau, 37 Rue J. Musch, 4920 Embourg, Belgium

Filed June 3, 1970, Ser. No. 43,127
Claims priority, application Belgium, June 11, 1969, 42306
Int. Cl. B01f 7/16
U.S. Cl. 259—107 **5 Claims**

In a container for conducting dielectric tests on insulating oils, there is provided a stirring means consisting of a

removable displaceable element equipped with a permanent magnet accommodated in the receptacle of said container



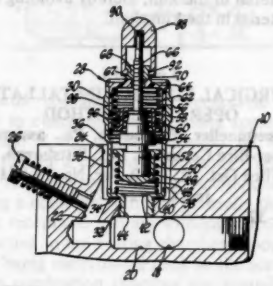
and moved by a magnetic control means located outside said receptacle.

3,645,509

IDLE AIR CONTROL

Clarence J. Eckert, and Benedetto C. Nardone, both of Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 25, 1970, Ser. No. 41,141
Int. Cl. F02m 23/10
U.S. Cl. 261—39 A 1 Claim



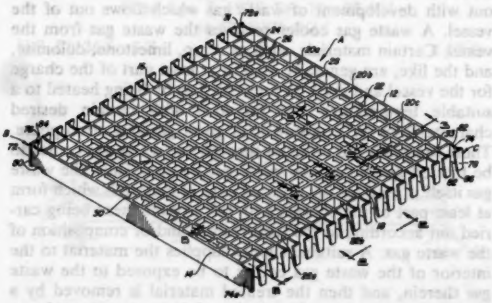
Idle airflow is bypassed around the closed throttle in an internal combustion engine induction passage and controlled by poppet and slide valve embodiments of an idle air control valve to regulate engine idle speed. The valves are positioned by a power element which is electrically heated to a predetermined temperature during the engine warmup period.

3,645,510

GRID MEMBER AND WALL FORMED THEREFROM

Warren L. Klugman, Middleburg Heights, Ohio, assignor to Ceilcote Company, Berea, Ohio

Filed Mar. 4, 1970, Ser. No. 16,470
Int. Cl. B01f 3/04
U.S. Cl. 261—94 6 Claims



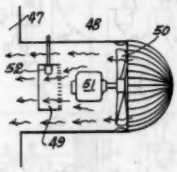
A grid member for supporting packings in liquid-gas contact apparatus is molded in one-piece of synthetic plastic material. The grid member is rectangular and has spaced-apart intersecting ribs which provide high-structural strength with a minimum of plastic material. The grid member includes interlocking projections extending outwardly from a pair of opposite side edges. A plurality of the grid members are assembled into a perforate grid supporting wall for supporting packings in liquid-gas contact apparatus.

3,645,511

PILOT FOR GAS BURNER

Erhard E. Alms, Barrington, and James E. Mitchell, Cary, both of Ill., assignors to AFE Industries, Inc., Lake Zurich, Ill., by said Mitchell

Filed Mar. 18, 1970, Ser. No. 20,543
Int. Cl. F23l 9/04
U.S. Cl. 263—19 A 2 Claims



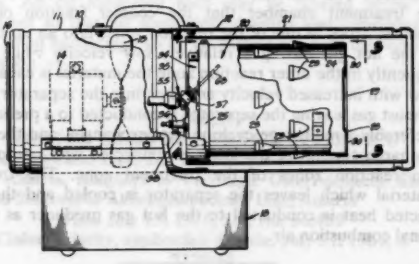
A pilot for a large capacity gas burner which uses a fixed metering orifice instead of an adjustable needle valve to produce a constant and reliable flame for igniting a relatively large capacity gas burner.

3,645,512

FORCED AIR HEATER

Charles E. Dent, Upland, and Donald A. Vaughn, Ontario, both of Calif., assignors to Scheu Manufacturing Company, Upland, Calif.

Filed May 13, 1970, Ser. No. 36,707
Int. Cl. F23l 9/04
U.S. Cl. 263—19 A 11 Claims



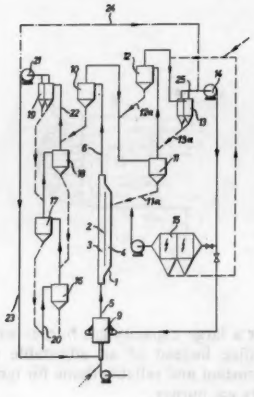
There is a disclosure herein a portable forced air heater including an outer housing containing a combustion chamber and a blower motor mounted upstream of the combustion chamber. An airscoop and nozzle assembly are mounted at the inlet end of the combustion chamber. The construction of the combustion chamber and burner components allows improved performance and relatively easy assembly and disassembly.

3,645,513

METHOD AND DEVICE FOR THERMICALLY TREATING FINE-GRAINED MATERIALS SUSPENDED IN A HOT GAS STREAM

Herbert Deussner, Bensberg, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Filed Jan. 15, 1970, Ser. No. 3,141
Claims priority, application Germany, Jan. 18, 1969, P 19 02 390.6
Int. Cl. F27b *15/00*
U.S. Cl. 263—21 A 5 Claims



Fine-grained material, such as lime, dolomite and magnesite, is subjected to a thermic treatment in suspension in a hot gas stream and the desired product is subsequently separated in a separator. A vertically disposed treatment chamber is divided into two vertical parallel reaction zones and is connected at its lower end with a hot gas producer whose hot gases pass through the treatment zones and into separator. The material to be treated is so introduced into the treatment chamber that the coarser fraction of the material drops in one of the reaction zones into an upstream of the hot gas having a relatively low velocity while subsequently in the other reaction zone the material is caused to flow with increased velocity and then into the separator. The exhaust gas leaving the separator is conducted to a preheater, preferably a multistage cyclone heat exchanger, and the dust discharge conduit of the latter is connected with one of the two reaction zones of the treatment zone. The treated material which leaves the separator is cooled and the extracted heat is conducted to the hot gas producer as additional combustion air.

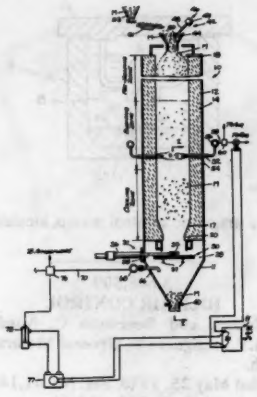
3,645,514

PRODUCTION OF REFRACTORY MATERIALS

Ernest A. Lado, Hastings-on-Hudson, N.Y., assignor to Nichols Engineering & Research Corp., New York, N.Y.

Filed July 2, 1970, Ser. No. 51,780
Int. Cl. F27b *1/00*
U.S. Cl. 263—29 7 Claims

The disclosure relates to the production of refractory material in a vertical shaft forced draft kiln wherein the air and fuel supply to the kiln are periodically and automatically interrupted for short periods of time. This effects the continuous and uniform, uncompacted downward travel of the refractory material in the kiln, thereby avoiding fusion of the refractory material in the kiln shaft.

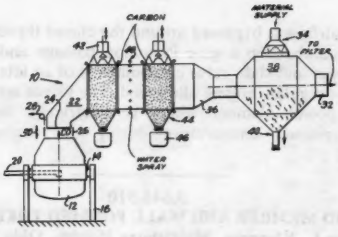


3,645,515

METALLURGICAL FURNACE INSTALLATION AND OPERATING METHOD

Roland Kemmetmueller, Pittsburgh, Pa., assignor to American Waagner-Biro Company, Inc., Pittsburgh, Pa.

Filed Oct. 12, 1970, Ser. No. 79,821
Int. Cl. F27b *7/02*
U.S. Cl. 263—32 36 Claims

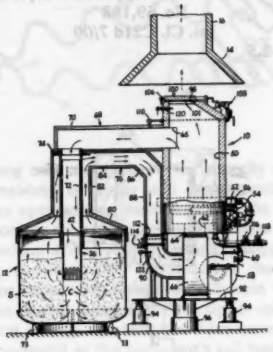


A metallurgical furnace installation and method for operating the metallurgical furnace installation. The installation includes a vessel in which metallurgical operations are carried out with development of waste gas which flows out of the vessel. A waste gas cooler receives the waste gas from the vessel. Certain materials, such as scrap, limestone, dolomite, and the like, are generally used as at least part of the charge for the vessel and must be pretreated as by being heated to a suitable temperature and provided with certain desired characteristics by exposure to a given gaseous atmosphere. These materials are directed through the waste gas cooler to be treated directly by the waste gas therein. Thus, the waste gas itself is used for the pretreatment of materials which form at least part of the charge, with this pretreatment being carried out according to the temperature and/or composition of the waste gas. A suitable supply supplies the material to the interior of the waste gas cooler to be exposed to the waste gas therein, and then the treated material is removed by a discharge device from the interior of the waste gas cooler to be utilized in the vessel of the furnace installation.

3,645,516
METHOD OF AND APPARATUS FOR PREHEATING SCRAP METAL

Alexander J. Turpin, and William T. Yarnell, both of Lebanon, Pa., assignors to Buell Engineering Company, Inc., Lebanon, Pa.

Filed Apr. 20, 1970, Ser. No. 30,010
Int. Cl. F27b 3/02
U.S. Cl. 263—40 25 Claims

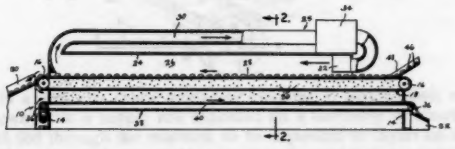


Scrap metal contained in a receptacle is preheated, preparatory to charging it into refining apparatus, by circulating through it hot gases generated by burning a carbonaceous fuel in a combustion chamber remote from the receptacle. The hot gases from the heating chamber are conducted along a confined path into generally the center of the scrap in the receptacle and are withdrawn from the receptacle and returned to the heating chamber, a portion of the exhaust gases being recirculated back to the scrap. Part of the gases in the combustion chamber are vented to a stack to make way for the introduction of the oxygen-containing gas that supports combustion in the combustion chamber. A substantial part of the combustibles in the scrap are vaporized and withdrawn from the scrap and are delivered to and burned in the combustion chamber, thus limiting a significant pollution factor in the operation. The combustion chamber and gas circulating equipment constitutes a unitary furnace structure that may be moved into and out of position in operative relation to the scrap receptacle.

3,645,517
METHOD AND APPARATUS FOR COLLECTING FINES PRODUCED DURING THE DRYING OF CHARCOAL BRIQUETTES

Frederick C. Mennen, Michigan City, Ind., assignor to United States Packaging Corporation, La Porte, Ind.

Filed Apr. 2, 1970, Ser. No. 25,101
Int. Cl. F27b 9/14
U.S. Cl. 263—5 Z 4 Claims

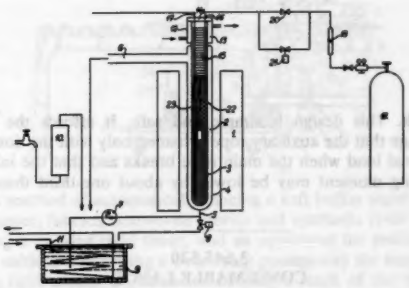


Method and apparatus for collecting fines produced during the drying of charcoal briquettes in a furnace. A conveyor having a run passing through the furnace for supporting the briquettes during the drying thereof is provided. The conveyor has openings therein through which fines produced during the drying process may fall. An endless power-driven belt having a run positioned under and generally coextensive with the briquette supporting run of the conveyor is provided to catch the falling fines and transport the fines to a depository which is spaced from the furnace.

3,645,518
HARDENING AND/OR TEMPERING FURNACE FOR SELF-HARDENING STEEL ALLOYS AND HIGH-SPEED STEELS

Claude P. Beguin, and Jean-Pierre F. Betrix, both of Peseux, Switzerland, assignors to Borel S. A., Peseux, Switzerland

Filed Feb. 3, 1970, Ser. No. 8,374
Claims priority, application Switzerland, Feb. 4, 1969, 1675/69
Int. Cl. C21d 1/76
U.S. Cl. 266—4 E 8 Claims



A furnace for hardening self-hardening steel alloys and high-speed steels comprises a chamber with double walls of refractory material such as quartz. A piece to be hardened is held in the chamber in an atmosphere of inert gas. Heating means bring the temperature in the chamber up to the hardening temperature of the piece which is then abruptly cooled by circulating cooling water between the double walls. An oil hardening bath may be located below the chamber so that air hardening, drawing and tempering as well as oil hardening can all be carried out with the same installation.

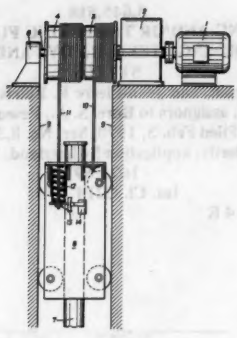
3,645,519
ROPE OR CHAIN RUPTURE SAFETY DEVICE

Walter Schwarz, Linz, and Karl Steinmair, Schiedlberg, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed July 13, 1970, Ser. No. 54,469
Claims priority, application Austria, July 31, 1969, A 7379/69
Int. Cl. C21c 7/06
U.S. Cl. 266—34 LM 5 Claims

A rope or chain rupture safety device for a blowing lance secured to two ropes or chains, respectively, of which one rope or chain is passed over a driven main drum and the other rope or chain is passed over an unstressed auxiliary drum, the auxiliary drum being connected with said main drum by means of a multiplate friction clutch arranged between them and rotatable relative to said main drum in case of a rope or chain rupture, in which the improvement resides in that the auxiliary drum comprises an element

which is rotatable relative to the main drum, connected with the shaft of the main drum by screw threaded means and screwable towards the friction clutch under progressively increasing engagement pressure of the plates of the friction



clutch. This design is simple and safe. It affords the advantage that the auxiliary rope is loaded only with the double nominal load when the main rope breaks and that the initial braking moment may be lower by about one-third than so far.

3,645,520

CONSUMABLE LANCE

Thomas R. Acre, Lower Burrell; Frederick M. Gimbel, Delmont; Sundaresan Ramachandran, Natrona Heights, and Thomas F. Beck, Bethel Park, all of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed July 29, 1970, Ser. No. 59,267

Int. Cl. C21c 7/06

U.S. Cl. 266—34 L **15 Claims**

Described herein is a consumable lance for introducing fluid into a liquid at a controlled angle of introduction as the lance is consumed.

3,645,521

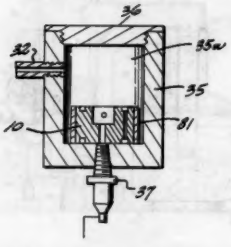
APPARATUS FOR TREATING ARTICLES OF MANUFACTURE TO ELIMINATE SUPERFLUOUS PROJECTIONS

Henry C. Geen, and Edwin E. Rice, both of Ann Arbor, Mich., assignors to Chemotronics, Incorporated, Ann Arbor, Mich.

Continuation of application Ser. No. 844,703, May 28, 1969, now abandoned, which is a division of application Ser. No. 723,052, Apr. 22, 1968, now Patent No. 3,475,299, which is a continuation-in-part of application Ser. No. 643,890, June 6, 1967, now abandoned. This application Sept. 2, 1970, Ser. No. 69,188

Int. Cl. C21d 7/00

U.S. Cl. 266—2.5 **10 Claims**



Apparatus for the elimination (destruction or removal) of superfluous projections, such as unwanted burrs and sharp edges, or shaped or fabricated articles of manufacture utilizing means for generating a transient thermal energy release in a compressed gaseous material provided in a sealed and confined space or chamber is described. In particular, the apparatus includes article-contacting shielding means within the chamber for allowing selected portions of the article to be exposed to the thermal energy release without substantially altering the configuration and working dimensions of the article. Preferably piston means connected by conduit means to the chamber is provided to compress a combustible gaseous material in the chamber prior to the ignition of the combustible gaseous material which generates the energy release.

3,645,522

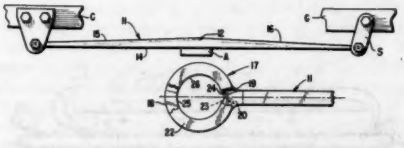
SPRING LEAF

Frederick T. Rowland, Birmingham, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed June 1, 1970, Ser. No. 42,290

Int. Cl. B60g 11/02; F16f 1/18

U.S. Cl. 267—54 **9 Claims**



A spring leaf comprising an integral substantially cylindrical eye structure on at least one of its ends consisting essentially of adjacent parallel portions cylindrically curved in opposite directions out of the plane of the leaf.

3,645,523

SEAT SPRING UNIT

Harold I. McMahon, High Point, N.C., and Albin J. Niewulis, Lexington, Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed Jan. 27, 1970, Ser. No. 6,256
Int. Cl. A47c *23/16*
U.S. Cl. 267—107 6 Claims

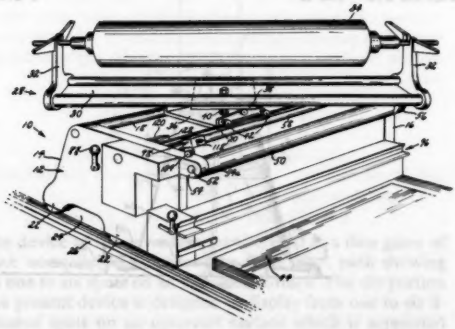
A seat spring unit mounted on horizontally spaced frame rails and consisting of upper and lower connected spring members. The upper spring member forms the primary load support section for the spring unit and includes a return bent upon itself section at its rear end which is supported on the lower spring member. This construction thus adapts the spring unit for supporting light loads wherein the entire resistance to the load is taken up by the upper spring member, the return bent section of which provides increased comfort for the seat occupant in the occupant's tail bone area where principal support is necessary for comfort. When heavier loads are applied to the spring unit, the lower spring member provides additional resilient resistance to load after the upper spring member has been deflected, thus enabling construction of seating units capable of comfortably supporting occupants whose weights vary over a wide range.

3,645,524

EDGE ALIGNMENT ASSEMBLY FOR CLOTH-SPREADING MACHINE

Harold H. Grimm, Bronx, and Ira Zuckerman, Far Rockaway, both of N.Y., assignors to Panther Machine Corp., New York, N.Y.

Filed June 8, 1970, Ser. No. 44,119
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 8 Claims



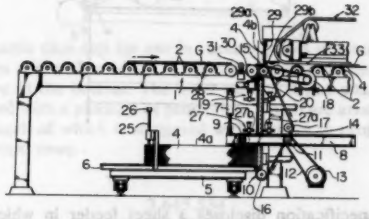
In a turntable fabric spreading machine in which fabric is drawn from a supply roll mounted on a turntable structure and fed through the machine to be deposited in layers on a table surface, the turntable structure is mounted on a carriage for lateral movement thereon and is driven in such lateral movement by a reversible motor mounted beneath said turntable structure and cooperating with a chain extending across the width of said carriage, a photoelectric sensing member is mounted on the carriage for scanning the edge of the fabric feeding through the machine, and is operatively connected to the motor for energizing the same to shift the turntable structure and fabric roll automatically in response to the sensing of a deviation in the lateral position of the fabric edge. The sensing means is movably mounted on the carriage by a linkage manually operable to shift the sensing member to a retracted position when the fabric is to be initially threaded through the machine.

3,645,525

METHOD AND APPARATUS FOR PLACING BUFFER SHEET ALONG MOVING RIGID SHEET

Kazuo Ishihara, Nishinomiya-shi; Toyoo Segawa, Higashiosaka-shi, and Hiroaki Zaita, Ichihara-shi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd.

Filed Aug. 18, 1969, Ser. No. 850,968
Claims priority, application Japan, Aug. 22, 1968, 43/60277; Aug. 23, 1968, 43/60661; Oct. 2, 1968, 43/86402
Int. Cl. B42c *1/00, 11/04*
U.S. Cl. 270—45 12 Claims



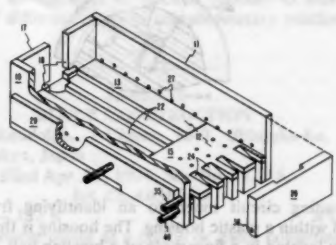
A method of automatically placing a soft buffer sheet such as paper, fabrics, nonwoven fabrics and synthetic resin films along a moving rigid sheet, and an apparatus for practicing the method comprising a conveying passageway for transferring rigid sheets, a station for keeping a stack of the buffer sheets, a vacuum device applying a suction to; and transferring the buffer sheets, a feed device for feeding the buffer sheets, a device for interrupting the vacuum device, related apparatus for bending the projecting end of the buffer sheet over the surface of the rigid sheet, and apparatus for conveying the buffer sheet covered rigid sheets by the use of vacuum suction means to a station where they are successively vertically registered and stacked in predetermined numbers.

3,645,526

NO-MOVING PARTS, PNEUMATIC HOPPER/SEPARATOR

Joseph J. Holecek, Byron, and Larry D. Zolnosky, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,549
Int. Cl. B65h *3/08*
U.S. Cl. 271—32 8 Claims



The disclosure pertains to a document hopper separator mechanism which is wholly pneumatically actuated to feed

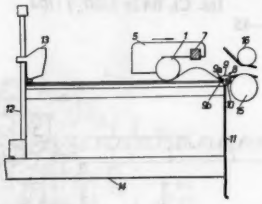
documents serially from the bottom of a document deck disposed therein. Riffle jets introduce air to support the deck and separate the lowermost documents from the document guide surface and one another while selectively operable eject jets function to eject the lowermost document from the hopper to a transport mechanism.

3,645,527

SHEET-FEEDING DEVICES

Albert George Ronald Gates, London, England, assignor to Gestetner Limited, Tottenham, London, England

Filed May 25, 1970, Ser. No. 39,977
Claims priority, application Great Britain, June 12, 1969, 29,957/69
Int. Cl. B65h 3/06
U.S. Cl. 271—42 11 Claims



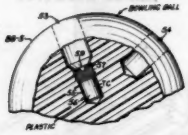
The specification discloses a sheet feeder in which the sheets are driven by one-way rotatable friction rollers mounted on a lever freely pivotably mounted on a reciprocable support, the height of the pivot of the lever being adjustable to vary the angle of inclination of said lever to the horizontal to adapt the sheet feeder for feeding different weight sheets. The pivot of the lever may also be adjustable forwards and backwards to adapt the feeder for different sheet sizes and thicknesses of paper.

3,645,528

BOWLING BALL INCLUDING TUNED LOADING CIRCUIT

William D. Cornell, Grand Haven, Mich., assignor to Brunswick Corporation

Original application July, 1965, Ser. No. 474,442, now Patent No. 3,447,804. Divided and this application Feb. 14, 1969, Ser. No. 799,392
Int. Cl. A63b 37/00
U.S. Cl. 273—63 R 6 Claims



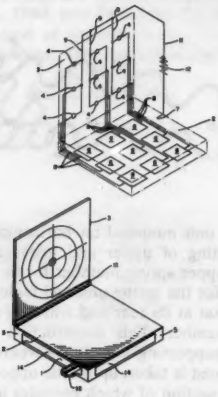
A loading circuit tuned to an identifying frequency is molded within a plastic housing. The housing is threaded into a cavity located in a fingerhole of a bowling ball. The circuit includes a resistor, a capacitor and an inductance coil connected in series.

3,645,529

ELECTRIC GAME BOARD WITH INDICATOR

Thomas W. Andrews, 2300 Bellfield Avenue, Cleveland Heights, Ohio

Filed Apr. 29, 1970, Ser. No. 32,904
Int. Cl. A63f 9/00
U.S. Cl. 273—108 10 Claims



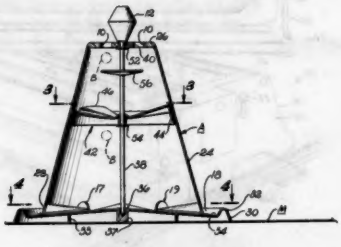
A game device of chance and skill is disclosed wherein electrically conductive game pieces are propelled in electrically contacting relationship between two facing horizontal conductive game board surfaces. One of the game board surfaces is electrically segmented into a plurality of conductive terminals which are electrically related to lights on a display board so that as a game piece moves between the game board surfaces, a visual display is presented on the display board to indicate the relative position of the game piece on the game board.

3,645,530

RANDOMLY EXITING BALL AND GAME APPARATUS

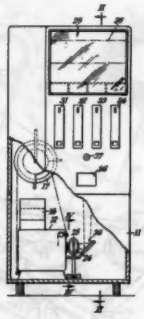
Edward A. Hernandez, 1500 Elevado Street, Los Angeles, Calif., and James B. Van Leeuwen, 4226 McFarland Avenue, Burbank, Calif.

Filed Mar. 12, 1970, Ser. No. 18,834
Int. Cl. A63b 71/00
U.S. Cl. 273—138 R 1 Claim



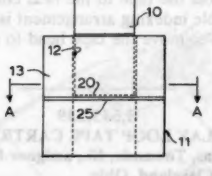
A random-event structure is disclosed for use with a ball which passes through the structure and exits randomly from one of a plurality of ports. A truncated conical housing encloses a rotary interference and distribution structure for randomly altering the path of a ball through the housing to exit from one of the ports which are spaced apart about the base of the housing.

3,645,531
RANDOMLY OPERATED PICTURE PROJECTING CHANCE APPARATUS
Lawrence Wright, Alresford, England, assignor to Backagee Limited
Filed May 14, 1969, Ser. No. 824,522
Claims priority, application Great Britain, May 16, 1968, 23,398/68
Int. Cl. A63b 71/06
U.S. Cl. 273—138 A 10 Claims



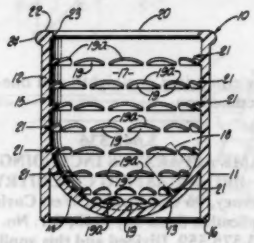
The specification discloses a gaming machine comprising a projector for projecting an endless film of horse races. The film is divided into four subframes a selected one of which is brought to a screen by means of a system of tilting mirrors. The selection of subframe is made at random twice in each race to give unpredictable variations of the race shown; a coin mechanism is provided so that bets can be made and winnings paid out in accordance with the outcome of the race.

3,645,532
DICE GAME OF CHANCE DEVICE
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.
Filed Dec. 21, 1970, Ser. No. 100,132
Int. Cl. A63f 5/04
U.S. Cl. 273—142 A 4 Claims



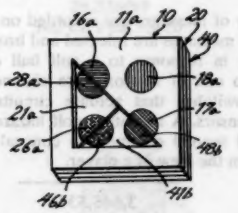
The device of this invention may be used in a dice game of chance normally requiring one or more dice, each showing from one to six spots on an upturned surface. The die portion of the present device is designed to display from one to six illuminated spots on an upturned surface which is supported on a base and rotated. When a die stops its rotating the number of spots illuminated will be a function of an angular position in relation to the base portion of the device. The base includes a mask and a light source, and the mask controls a passage of light to the light-admitting ends of an array of light guides which extend to the upturned surface. The device also includes means for stopping the rotating die at one of a predetermined number of possible angular positions.

3,645,533
DICE CUP
Victor Lester, P.O. Box 608, Sonora, Calif.
Filed Sept. 24, 1970, Ser. No. 75,223
Int. Cl. A63f 9/04
U.S. Cl. 273—145 A 12 Claims



A plastic dice cup for use in various games of amusement includes a chamber which is cylindrical along the sides and concave at the bottom. The inner surface of the chamber is provided with a plurality of projections which are arranged in rows, each of which is staggered with respect to projections in adjacent rows.

3,645,534
CARD PUZZLE
Joseph A. Weisbecker, 1220 Wayne Avenue, Erlton, Cherry Hill, N.J.
Filed Nov. 12, 1969, Ser. No. 875,801
Int. Cl. A63f 9/08
U.S. Cl. 273—157 A 4 Claims

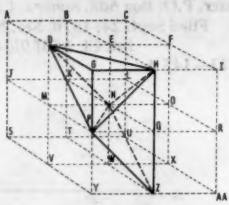


A group of cards each having a through opening and a characteristic marking proximate to the through opening, adapted for arrangement in stacked relation to locate the markings of different cards in complementary relation with each other.

3,645,535
BLOCK CONSTRUCTION
Alexander Randolph, 1-Chome 10-9, Shinjuku-ku, Naka Ochiai, Tokyo, Japan
Filed Apr. 23, 1970, Ser. No. 31,175
Int. Cl. A63f 9/12
U.S. Cl. 273—157 R 8 Claims

A block system useful as a puzzle or game consisting of a group of solids adapted to be assembled into a larger regular polyhedron. The solids each have shapes that are determined by an assembly of components that include a tetrahedron and

one or more fractional sections of an octahedron. The fractional sections comprises one-eighth and one-fourth sections of a regular octahedron.



3,645,536

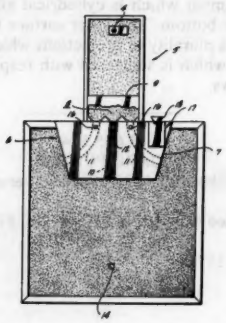
GOLF GAME APPARATUS INCLUDING MESSAGE BROADCASTING CIRCUITRY

Francis X. Tierney, 96 Gardenglen, West Covina, Calif.

Original application Sept. 23, 1968, Ser. No. 761,512, now Patent No. 3,575,559. Divided and this application Feb. 8, 1971, Ser. No. 113,354

Int. Cl. A63b *69/36*

U.S. Cl. 273—185 R **1 Claim**



A plurality of messages are recorded on magnetic tape or the like. The messages are selected and broadcasted in a random fashion in response to a golf ball or the like being knocked into one of two or more channels which contain sensors or switches that actuate circuits associated with respective sensors. A miniature golf hazard is disposed over the first and second channels to conceal the entry of the channels from the view of a player.

3,645,537

TILTTOP GOLF TEE

Leo R. Parenteau, Drummondville, Quebec, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 77,932

Int. Cl. A63b *57/00*

U.S. Cl. 273—207 **4 Claims**

A golf tee comprising a thin flexible horizontal disc having a ball-receiving recess; an inverted elongated metal cone; and a vertical spongy cylinder disposed and connected between the disc and the cone.

3,645,538

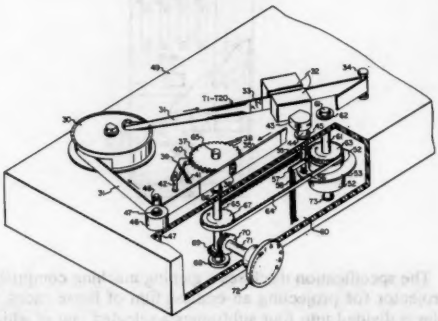
DEVICE FOR POSITIONING A TAPE HEAD TO TRACKS OF A MULTITRACK RECORDING TAPE

Joseph James Zimmermann, Elm Grove, Wis., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed June 22, 1970, Ser. No. 48,368

Int. Cl. G11b *5/00*

U.S. Cl. 274—4 A **7 Claims**



A device for sequentially positioning a tape head to consecutive tracks of a cartridge-type multitrack recording tape, wherein a short section of heavy-type tape having a small rectangular opening formed therein is spliced into the tape loop. A sprocket gear having an associated spring-biased detent pawl is so located that the rectangular opening will successively engage one tooth of the gear at a time for each complete cycle, or revolution, of the tape, to cause the gear to rotate an angular increment determined in accordance with the number of teeth thereon. A cam is rotatably controlled by the gear for moving a cam follower, which is attached at one end to the tape head, for moving the tape head transversely across the tape to the next consecutive track. A manually operable indexing arrangement is provided for controlling the cam to move the tape head to any selected track on the tape.

3,645,539

DELAY LOOP TAPE CARTRIDGE

John Paul Jenkins, Towanda, Ill., assignor to Harris-Intertype Corporation, Cleveland, Ohio

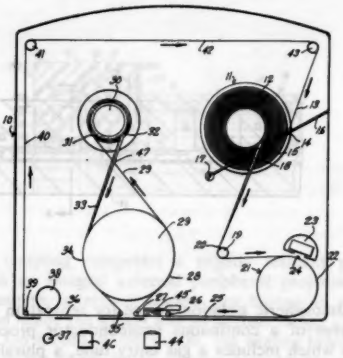
Filed Mar. 19, 1969, Ser. No. 808,584

Int. Cl. G11b *25/06, 23/06*

U.S. Cl. 274—4 B **6 Claims**

A tape delay cartridge device having a continuously moving closed loop of magnetic tape passing adjacent to a record head and subsequently adjacent to a playback head. A secondary loop of the tape is formed between the record head and the playback head such that there is an excess of length therebetween. This excess of length or loop provides a delay in the playback of information recorded by the record head. In this way, information being recorded can be continuously monitored, and the tape can be stopped before any bit of information reaches the playback head to delete certain portions thereof such as may be required in censoring telephone conversations or the like which are to be broadcast "live." The delay loop may be of a variable length in that the mag-

netic tape is wound a plurality of times around a reel prior to passing adjacent to the playback head. A flywheel is provided to stabilize the motion of the tape as it passes from the record head to the playback head through the delay reel and loop assembly. The entire magnetic tape takes the form of a



closed loop, and it is wound about a storage reel which may include any variable length of the magnetic tape thereby providing a long tape and avoiding the splice problems associated with a small closed loop wherein the splice passes beneath the playback head in rapid succession.

3,645,540

DEVICE FOR CONNECTING ELECTRICAL CIRCUITS

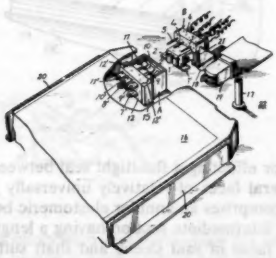
Yoshinobu Tanaka, Warabi-shi, and Kiyoshi Takahashi, Saitama-ken, both of Japan, assignors to Teikoku Dempa Co., Ltd., Tokyo, Japan

Filed June 19, 1969, Ser. No. 834,680

Claims priority, application Japan, Nov. 25, 1968, 43/102104; Nov. 28, 1968, 43/103245; Oct. 28, 1968, 43/93290; 43/93291; 43/93288; June 9, 1968, 43/51269; Oct. 10, 1968, 43/93289

Int. Cl. G11b *5/00*

U.S. Cl. 874—4 R **11 Claims**



A jack and plug connector for electrical circuits and particularly cartridge-type tape players or radio receiving equipment with the plug being mounted on the chassis of the tape player and the jack being mounted on or a part of the cartridge insertable in the tape player whereby when the cartridge is inserted in the tape player, the jack and plug are plugged into one another providing an electrical connection between the circuits of the tape player and the cartridge.

3,645,541

PICKUP ARMS

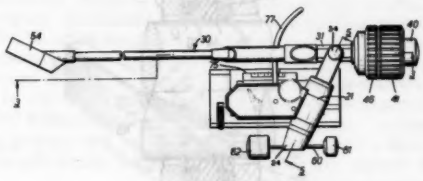
Alastair John Robertson-Aikman, "Stokes," Steyning, Sussex, England

Filed Mar. 17, 1969, Ser. No. 807,547

Claims priority, application Great Britain, Mar. 19, 1968, 13,318/68

Int. Cl. G11b *3/10*

U.S. Cl. 274—23 R **18 Claims**



This invention relates to an improved phonograph pickup arm assembly affording a wide range of adjustments. In particular, the arm includes means for adjusting playing weight in which variation of playing weight is accompanied by automatic adjustment of a force correcting the side thrust of skating force at the stylus. The correcting force is produced by inclination of the pivotal axis of the arm by an angular amount about which produces an appropriate horizontally resolved part of the vertical force of the stylus. The pickup arm can be unplugged towards its inward end.

3,645,542

SEALING RINGS

Frederick J. Adams, Campton, England, assignor to Cam Gears Limited, Hitchin, Hertfordshire, England

Filed May 25, 1970, Ser. No. 40,319

Claims priority, application Great Britain, June 10, 1969, 29,336/69

Int. Cl. F16j *15/18*

U.S. Cl. 277—1 **9 Claims**

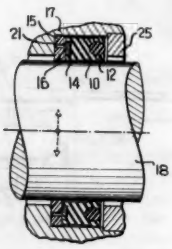
A multiple ring seal installed with the constituent rings in separated relation and automatically assembled upon application of pressure after installation. The seal includes an axially grooved resilient first ring and a rigid second ring having at least a portion seated in the groove of the first ring to stiffen the inner and outer peripheral sealing legs of the first ring. The resilient first ring is sufficiently flexible that during installation it will easily pass through a bore or around a member to be sealed without being damaged by rough surfaces, ports or recesses and the rigid second ring may be split or sized to fit the parts to be sealed. The second ring may have a head flange overlying the first ring to align with the groove a stem portion to be seated in the first ring.

3,645,543

SHAFT PACKING ASSEMBLY

Kazimierz T. Ksieski, Inglewood, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 14, 1970, Ser. No. 63,678
Int. Cl. F16j 15/32
U.S. Cl. 227—58 9 Claims



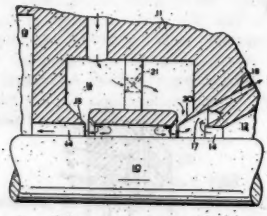
This disclosure relates to a packing capable of accommodating limited transverse relative movement of a shaft and housing sealed thereby. The packing includes a combination of backup rings which prevent seal extrusion between the shaft and the housing while permitting the transverse movement.

3,645,544

SEAL PRIMARILY FOR A TURBINE

Robert George Unsworth, and Arnold Bainbridge, both of Rugby, England, assignors to The English Electric Company Limited, London, England

Filed Aug. 27, 1969, Ser. No. 853,292
Claims priority, application Great Britain, Aug. 27, 1968, 40,862/68
Int. Cl. F16j 15/44
U.S. Cl. 277—70 6 Claims



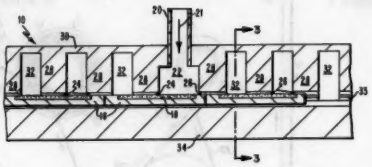
A pressure seal is provided as an alternative to the normal gland or labyrinth seal between two relatively rotatable members 10, 11. In this seal an annular jet of seal fluid is directed from a first duct 15 defined in one of the members 10, 11 towards the other member so as to form a moving curtain of seal fluid therebetween, and means 19 is provided for forming an annular mass of seal fluid on the higher pressure side of the moving curtain whereby to prevent entrainment of fluid from the region 12 which adjoins the higher pressure side into the moving curtain and thence into the region 13 adjoining the lower pressure side. A second duct 20 may be defined within the one member 11 for the purpose of forming a further moving curtain of seal fluid between the annular mass and the higher pressure region 12. The second duct 18 may be fed from the same pressure source as the first, suitable throttling means 21 being interposed between the two.

3,645,545

ENTRANCE-EXIT ATMOSPHERIC ISOLATION DEVICE

Richard R. Garnache, South Burlington, and Donald M. Kenny, Shelburne, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1970, Ser. No. 59,496
Int. Cl. B65d 53/00
U.S. Cl. 277—72 SR 9 Claims



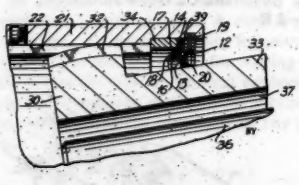
An atmospheric isolation device for separation of two atmospheres of a continuous semiconductor processing apparatus which includes a gas entry tube, a plurality of first gas restricting means leading to a first atmosphere, a plurality of second gas restricting means leading to a second atmosphere, and adjacent to each gas restricting means an expansion chamber for increasing back pressure and for destroying lift produced by the Bernouilli effect of the gas passing through the restricting means.

3,645,546

SEALING RING

Samuel Kaufman, Tappan, N.Y.; Donald E. De Rocker, Ramsey, N.J., and Herbert A. Conrad, Tappan, N.Y., assignors to Sier-Bath Gear Co., Inc., North Bergen, N.J.

Continuation-in-part of application Ser. No. 813,146, Apr. 3, 1969. This application Mar. 29, 1971, Ser. No. 128,793
Int. Cl. F16j 15/16
U.S. Cl. 277—205 10 Claims



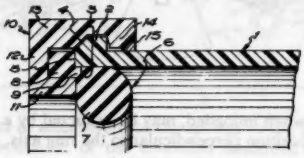
A ring for effecting a fluidtight seal between the confronting peripheral faces of relatively universally movable sleeve and shaft comprises an annular elastomeric body member including an intermediate section having a length between said peripheral faces of said sleeve and shaft sufficiently greater than the distance between said peripheral faces to accommodate the maximum misalignment of said sleeve and shaft without breaking the seal. In a preferred embodiment, the intermediate section is defined by converging conical walls joined at a circular elbow permitting movement of the walls about the elbow. Flanges projecting from the free edges of the walls and self-hinged thereto have annular channels in which are nested rigid coplanar annuli. The inner flange tightly engages the shaft surface and the outer flange is restrained between shoulders on the sleeve.

3,645,547

PIPE COUPLINGS

John B. Glover, Stocksbridge, England, assignor to The Hepworth Iron Company Limited

Filed Oct. 17, 1969, Ser. No. 867,313
Claims priority, application Great Britain, Feb. 7, 1969, 6,837/69
Int. Cl. F16j 15/10; F16l 21/02
U.S. Cl. 277—207 6 Claims



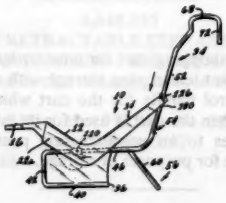
A pipe coupling comprises a slightly resilient plastics socket with an integral external peripheral projection adjacent its mouth, a resilient sealing ring having an annular sealing head inside the socket and an annular flange abutting the rim of the mouth of the socket, the sealing head being connected to the flange by an annular neck having a radial thickness less than the axial and radial thicknesses of the flange, and a locking ring of slightly resilient channel section plastics material, with the annular base of the channel section lying against the face of the flange of the sealing ring, remote from the mouth of the socket, with the annular inner side of the channel section locking ring lying against the inside face of the flange of the sealing ring and having an axial depth not greater than the axial thickness of the flange, and with the annular outer side of the channel section locking ring overlapping the outside of the mouth of the socket and having on its inner face an integral peripheral projection engaging behind the projection round the outside of the socket.

3,645,548

SAFETY AUTO SEAT

Arthur N. Briner, 17126 Sunderland Drive, Granada Hills, Calif.

Filed July 28, 1969, Ser. No. 845,460
Int. Cl. B60r 21/10; A47c 1/08
U.S. Cl. 297—216 3 Claims



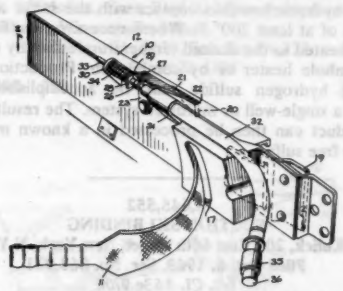
The device is a safety auto seat particularly for children. It comprises a seat having a back portion and a seat portion mounted on a frame, the frame being configurated to be suspended or hung over the back of an auto seat. The seat itself is attached to the frame to allow relative movement as between the seat and the frame, to allow relative movement as between the seat and the frame, the occupant of the seat being normally held therein by a strap. Sliding connections are provided between the back portion of the seat and the frame and between the seat portion of the seat and the frame so that in the event of a collision (head-on, for example) and high deceleration forces the seat can translate moving forward relative to the frame and thus protecting the occupant from injury from the impact.

3,645,549

AUTOMATIC BELT RETRACTOR

George H. Jantzen, Bronx, N.Y., assignor to M. Steinthal and Company, Inc., New York, N.Y.

Filed June 23, 1969, Ser. No. 835,345
Int. Cl. B60r 21/10; A62b 35/82; A47d 15/00
U.S. Cl. 297—388 20 Claims



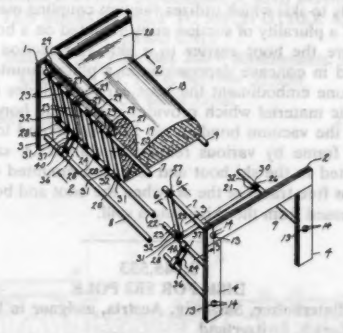
An elongated retractor serves as a guide for a retracting slide within it. When the belt is fully extracted, the slide is pulled to a position where it engages a pivotable locking member and is locked against retracting the belt. A cable is arranged to push or pull the locking member about its pivot axis out of engagement. A spring holds the locking member in position for engagement when the cable is not actuated.

3,645,550

FURNITURE CONSTRUCTION

Roy J. Biehl, Milwaukee, Wis., assignor to Sahn, Inc., Milwaukee, Wis.

Filed Oct. 15, 1969, Ser. No. 866,684
Int. Cl. A47c 7/02; A44c 5/18
U.S. Cl. 297—454 2 Claims



A pair of inverted U-shaped end pieces joined by upper and lower back beams and a front beam form the skeleton of a sofa that employs a tensioned system of leather straps to support seat and back cushions. Back straps generally are vertically strung between the upper back beam and a floating beam. Seat straps are generally horizontally strung between the front beam and the floating beam. Adjustable tensioning

straps stretch from the lower back beam to the floating beam. Unique, self-tightening attachments of the straps to the beams use novel H-shaped, cast aluminum fasteners.

3,645,551

CONVERSION OF UNDERGROUND SULFUR DEPOSITS

Robert R. Thompson, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed June 8, 1970, Ser. No. 44,554
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 8 Claims

Sulfur in underground deposits can be readily converted to hydrogen sulfide, and the latter produced, by bringing a suitable hydrocarbon into contact with the sulfur at a temperature of at least 200° F. Where necessary, the formation may be heated to the desired temperature either by means of a bottomhole heater or by combustion. Production of the resulting hydrogen sulfide may be accomplished either through a single-well or multiwell system. The resulting gaseous product can then be processed in a known manner to produce free sulfur.

3,645,552

SUCTION SKI BINDING

George Kulick, 201 East 66th Street, New York, N.Y.

Filed Oct. 6, 1969, Ser. No. 863,921
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 M 10 Claims

Disclosed herein is a release binder for releasably securing ski boots to skis which utilizes vacuum coupling means in the form of a plurality of suction cups mounted on a boot carrier to secure the boot carrier to a ski. The suction cups are received in concave depressions in a plate mounted on the ski. In one embodiment the boot carrier includes a sheet of magnetic material which provides a magnetic bond in addition to the vacuum bond. A ski boot is secured to the boot carrier frame by various releasable clamps. A safety cord connected to the ski boot and to a reel mounted on the ski restrains free travel of the ski when the boot and boot carrier are released from the ski during a spill.

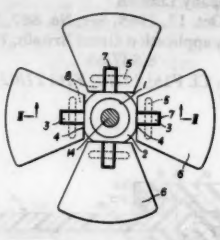
3,645,553

DISK FOR SKI POLE

Hans Hinterholzer, Salzburg, Austria, assignor to Intamin A. G., Zurich, Switzerland

Filed Sept. 15, 1969, Ser. No. 858,026
Claims priority, application Austria, Sept. 16, 1968, A 8986/68
Int. Cl. A63c *11/24*
U.S. Cl. 280—11.37 Z 9 Claims

A disk for a ski pole is formed from four generally cloverleaf-shaped vanes mounted on a ring which is limitedly swivelable on the stem of the pole near its pointed lower end, the vanes being individually pivoted to that ring for swinging downwardly under a load of snow into a limiting position in which they may form a generally frustopyramidal structure.



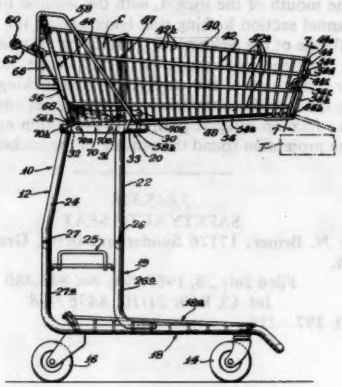
The vanes, when unloaded, may be retracted by a spring into a coplanar position perpendicular to the ring axis.

3,645,554

SHOPPING CART

Gene B. Von Stein, and Norman R. Young, both of Oklahoma City, Okla., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed May 4, 1970, Ser. No. 34,016
Int. Cl. B62b *11/00*
U.S. Cl. 280—33.99 R 10 Claims



A high-basket shopping cart for counter-level discharge is arranged for basket-telescoping storage with similar carts by providing a control handle for the cart which is at a convenient height when the cart is used for its intended purpose and which moves to an unobstructing position when the baskets telescope for purposes of storage.

3,645,555

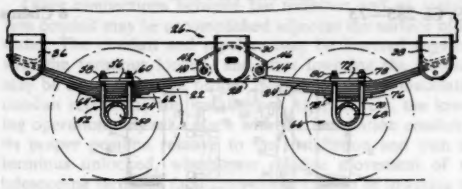
TANDEM AXLE SUSPENSION

Charles O. Traylor, Springfield, Mo., assignor to Hutchens and Son Metal Products, Inc., Springfield, Mo.

Filed Dec. 11, 1969, Ser. No. 884,373
Int. Cl. B60g *5/06*
U.S. Cl. 280—104.5 B 5 Claims

A tandem axle suspension whereby each of the tandem axles is fastened to an associated spring by means of an axle seat assembly and each of the springs is nonslidably connected at one end to an equalizer assembly which is fastened to the frame of the vehicle and slidably connected at the other end to hanger brackets likewise fastened to the frame.

The springs are fixed to a pivot beam on the equalizer assembly, preferably at a point below the axis of rotation of the pivot beam, so that during acceleration and deceleration, the tendency of the wheels to impart undesirable rotation to the axles, with resultant rotation of the beam, is opposed by horizontal forces generated by the springs on the pivot beam



at the points of attachment of the springs to the pivot beam. In the embodiment of the invention described below, the springs each are clamped to the axle by means of a pair of serrated plates, one of which is movable with respect to the other to vary the separation between the axle and the end of the spring fixed to the pivot beam.

3,645,556

SAFETY NET PILLOW FOR VEHICLE PASSENGERS

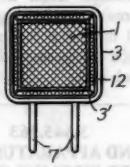
Yasusaburo Kobori, Tokyo, Japan, assignor to Kabushikikaisha G.I.C., Tokyo, Japan

Filed Dec. 12, 1969, Ser. No. 884,477

Claims priority, application Japan, Dec. 18, 1968, 43/109928; May 15, 1969, 44/46072

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 B **2 Claims**



A safety net pillow for the prevention of the snapping back of the head of a vehicle passenger having a net stretched on a frame, and leg means attached to the lower portion of the frame for detachably mounting the frame on the back of a seat of the vehicle in such a manner that the net stretched on the frame stands substantially upright.

3,645,557

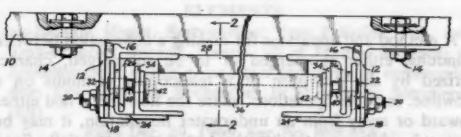
FOLDABLE RETRACTABLE STEP ASSEMBLY FOR CAMPERS AND LIKE VEHICLES

Art Aldropp, and Archie Aldropp, both of P.O. Box 95, Langlois, Oreg.

Filed Mar. 25, 1970, Ser. No. 22,593

Int. Cl. B60r *3/02*

U.S. Cl. 280—166 **1 Claim**



A foldable retractable step assembly for campers and like vehicles comprises a bracket with means for attachment to a structural support member of a camper. At least one step and riser, preferably a plurality of steps and risers, are suspended on the bracket. Pivotal mounting means with associated stop means pivotally mount the upper end of the upper riser on the bracket and the upper ends of the subsequent risers on the outer ends of the adjacent steps. Pivotal mounting means mount the inner ends of the steps on the lower ends of the risers. The steps and risers thus are alternately adjustable between an extended use position, and a folded, nesting, transport position underlying the bracket. Retracting means are associated with the bracket which enable retraction of the folded assembly beneath the support when the assembly is in transport position.

3,645,558

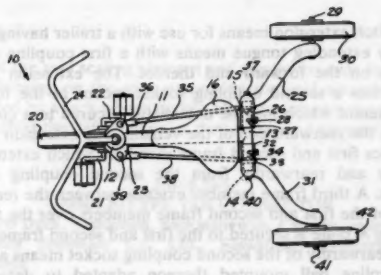
BICYCLE TRAINER VELOCIPEDE

Wayne W. McMullen, Coon Rapids, Minn., assignor to Frank C. Freidheim, Minneapolis, Minn.

Filed Mar. 31, 1970, Ser. No. 24,222

Int. Cl. B62k *5/08*

U.S. Cl. 280—270 **3 Claims**



A velocipede having swingable rear wheel mounts controlled by the steering of the velocipede so that on turning the front wheel of the velocipede the swinging rear wheel mounts are swung oppositely to cause the velocipede to bank in the same manner as the bicycle is banked in making a turn. The velocipede rider is thus trained in the motions a bicycle will make on turning to assist in preparing him to ride a bicycle.

3,645,559

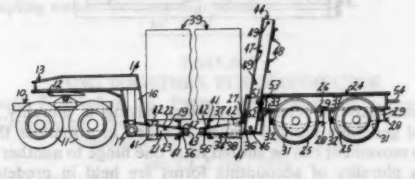
TRAILER HAVING GOOSENECK AND BOGIE CONNECTED SELECTIVELY TO EACH OTHER AND TO CARGO UNIT

George T. Stafford, Jr., P.O. Box 2805, Birmingham, Ala.

Filed Apr. 24, 1970, Ser. No. 31,658

Int. Cl. B62d *53/08*

U.S. Cl. 280—415 B **2 Claims**

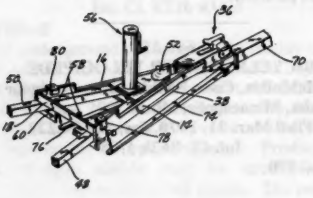


Apparatus connecting gooseneck and bogie selectively to each other and to cargo unit. Support members extend rearwardly from gooseneck and forwardly from bogie and detachably connected to adjacent portions of cargo unit. Connector member carried by bogie and connectable to support members.

3,645,560
HITCH EXTENSION MEANS

Merrell D. Steele, 822 East Broadway, Des Moines, Iowa

Filed May 6, 1970, Ser. No. 35,195
Int. Cl. B60d 1/00
U.S. Cl. 280—482 4 Claims

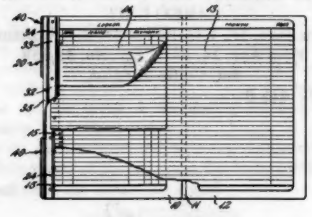


A hitch extension means for use with a trailer having a forwardly extending tongue means with a first coupling socket means on the forward end thereof. The extension means comprises a second coupling socket means at the forward end thereof which may be detachably secured to a coupling ball at the rearward end of the vehicle. The extension means includes first and second frame members which extend outwardly and rearwardly from the second coupling socket means. A third frame member extends between the rearward ends of the first and second frame members over the tongue means. A plate is secured to the first and second frame members rearwardly of the second coupling socket means and has a coupling ball mounted thereon adapted to detachably receive the first coupling socket thereon. Means is provided on the extension means to limit the movement of the extension means with respect to the trailer tongue.

3,645,561
CLAMP BOARD FOR MULTIPLE ENTRY ACCOUNTING

Richard G. Kendall, 207 Stevens Mills Road, Auburn, Maine

Filed July 8, 1970, Ser. No. 53,051
Int. Cl. B41l 3/04
U.S. Cl. 282—29 B 3 Claims

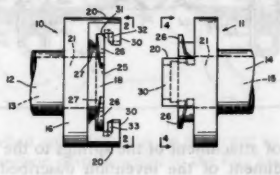


A multiposition clamp apparatus having a plurality of spaced generally parallel hinges arranged in a manner that clamp movement can be shifted from one hinge to another so that a plurality of accounting forms are held in predetermined selected position to record information on a plurality of documents simultaneously and such documents can applied and removed independently. The multihinged clamp can be selectively moved to any one of a plurality of positions and in certain positions the clamp will remain in fixed position while in other positions the clamp will move automatically.

3,645,562
COUPLING DEVICE

Matthew R. Fandetti, 42 Belmont Street, Brunswick, Maine, and Joseph P. De Azevedo, 1065 Farm Road, Secaucus, N.J.

Filed Mar. 10, 1970, Ser. No. 18,136
Int. Cl. F16l 55/00
U.S. Cl. 285—73 6 Claims

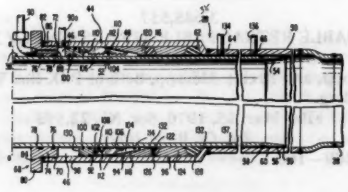


A coupling device consisting of a pair of identical one-piece units adapted to be placed into and out of interlocking engagement. Each unit includes a cylindrical first member, a second member extending above the first member, and a pair of third members extending above the first and second members, the upper surfaces of these members being planar and parallel. An opening extends through the first and second members. The second member is formed with a pair of spaced inwardly extending recesses and includes a plurality of spaced first locking elements each of which is positioned to a side of corresponding recess. Each first locking element has a lower surface spaced from the upper surface of the first member and inclined downwardly in a direction away from the corresponding recess. Each third member includes a second locking element projecting over and above the second member and having a lower surface that is spaced from the upper surface of the second member and is inclined downwardly from each end.

3,645,563
METHOD AND APPARATUS FOR MAKING SUBMERGED PIPELINE CONNECTIONS

William R. Rochelle, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed May 7, 1969, Ser. No. 822,409
Int. Cl. F16l 35/00
U.S. Cl. 285—24 24 Claims



A method and apparatus for making a connection between conduits, either submerged or to be submerged, characterized by the provision of a telescoping terminus on a flowline. In some operations where the flowline is laid either toward or away from an underwater installation, it may be lowered, while maintaining the terminus substantially fixed with respect to the remainder of the flowline, to a submerged position where the terminus is spaced from the installation. Subsequently, the terminus is telescoped into engagement with an alignment means, such as a riser adapter, either through diver assistance, or by remote operation of a terminus moving means. This means may be provided by a flexi-

ble drawline, which may be threaded through the alignment means, attached to the terminus, and subsequently tensioned to telescope the terminus. Release of the drawline may be accomplished through the application of fluid pressure.

Means are provided for latching the terminus into the riser adapter and for locking a slip joint between the terminus and the remainder of the flowline.

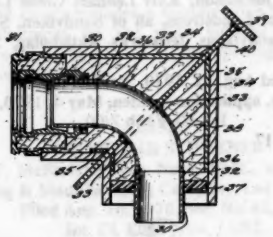
Other connections between the terminus and an installation conduit may be accomplished adjacent the surface of the water. The conduit and pipeline may be lowered together, with the terminus locked, and after lowering the terminus may be freed to permit proper positioning of the installation conduit relative to the installation. Alternatively, the lowering operation may take place with the installation conduit in its proper position relative to the installation and with the terminus unlocked, whereupon relative movement of the telescoping terminus facilitates the operation of lowering the installation conduit and the connected flowline. After lowering the slip joint may be locked.

3,645,564

INSULATED CONDUIT-FITTING ASSEMBLY

Winfield F. Corriston, Far Hills, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,155
Int. Cl. F16l *59/16*
U.S. Cl. 285—47 **7 Claims**



An insulated conduit-fitting assembly comprising an outer casing having a support shell secured to its inner edge. An inner transfer pipe is positioned within the outer casing and is surrounded by insulation material filling a substantially annular space. One end of the inner transfer pipe is recessed within the outer casing, with the recessed end of the inner transfer pipe having a coupling assembly mounted thereon. At least one end of the inner transfer pipe extends beyond the edge of the outer casing with each of the extended ends of the inner transfer pipe cooperating with an end sealing ring. The support shell is positioned within the outer casing so that it is separated from the ring coupling assembly and the end seal by insulation material.

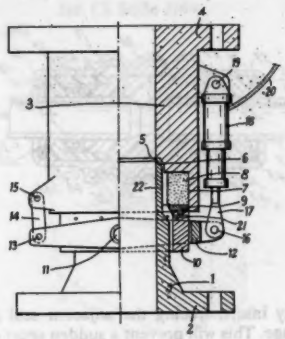
3,645,565

SEALINGTIGHT, CONTROLLED-FRICTION CONNECTING DEVICE BETWEEN TWO PIPE ELEMENTS

Jean-Jacques Houot, Sartrouville; Yves Pelissier, Pau, and Jean-Francois Durand, Nantes, all of France, assignors to Etablissement public a caractere industrial et commercial dite: Entreprise De Recherches Et D'Activites Petrolieres (Elf)

Filed Dec. 29, 1969, Ser. No. 888,658
Claims priority, application France, Dec. 31, 1968, 183119
Int. Cl. F16l *55/00*
U.S. Cl. 285—18 **2 Claims**

A device for connecting two pipe elements to one another, comprising a sealing element which is deformable under mechanical force, and has a considerable potential deformation, and an assembly carried by one of the parts to be connected together and adapted to compress the said deformable sealing element, the assembly comprising a ring applied



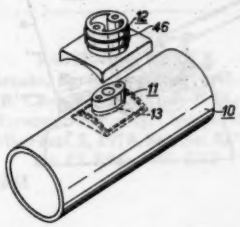
against the said sealing element and carried by rods fast with links bearing on the part supporting the said assembly and operated by a jack whose mobile element actuates the ring so as to effect the deformation of the said sealing element.

3,645,566

SADDLE-TYPE TEE CONNECTOR

Gerhard Dyck, Saskatoon, Saskatchewan, Canada, assignor to Dyckes Sprinkler Co. Ltd., Saskatoon, Saskatchewan, Canada

Filed Dec. 4, 1969, Ser. No. 882,203
Claims priority, application Canada, Dec. 20, 1968, 038,380
Int. Cl. F16l *5/00*
U.S. Cl. 285—197 **27 Claims**



A saddle-type tee fitting for a pipe is herein provided. The tee includes a particularly recited external component adapted to be situated on the exterior wall of the pipe, a particularly recited internal component adapted to be situated within the pipe near the external component, and a particular coupling means for these components.

3,645,567

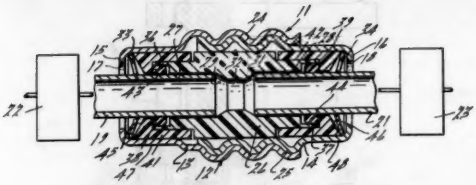
PUSH TOGETHER TUBE CONNECTOR

Joseph F. Reinker, Jr., Parma, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 24, 1970, Ser. No. 13,438
Int. Cl. F16l *17/00*
U.S. Cl. 285—340 **5 Claims**

A connector for coupling tube ends by pushing the ends into the connector. The assembly comprises a housing having two separable sections, an inner body insert within the housing into which the tube ends are pushed, from opposite sides, annular seals retained by the inner body insert and engaging the tube ends, and at least one outer body insert confining its

adjacent seal and held in place by the housing. Partial separation of the housing sections will permit pressurized fluid in the connection to force the outer body insert away from the



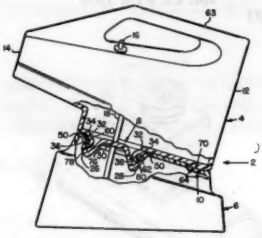
inner body insert, freeing the adjacent seal and permitting slow leakage. This will prevent a sudden spurt of fluid such as Freon from causing injury to the operator. Reconnection is obtained by reuniting the housing sections.

3,645,568

METHOD AND APPARATUS FOR CONNECTING AND LOCKING TWO MEMBERS TOGETHER

Samuel A. Halaby, Jr., Pittsford, N.Y., assignor to Samuel Halaby, Inc., Rochester, N.Y.

Filed July 24, 1969, Ser. No. 844,307
Int. Cl. F16l *17/00*
U.S. Cl. 285—360 **7 Claims**



The combination of: (1) a bayonet or other turn-type connecting mechanism for connecting two members together, and (2) a separate locking mechanism, spaced from the connecting means, and automatically put in locking engagement at a predetermined angular orientation of the two members as they are being turned to connect them together. Before rotating the two members to disconnect them, the locking mechanism must be disengaged; this is accomplished by a combination tilting and rotational movement of the two connected members.

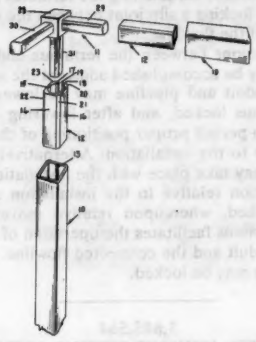
3,645,569

CONNECTOR FOR JOINING TUBULAR MEMBERS

Frederick W. Reilly, Toronto, Ontario, Canada, assignor to Beautiline Limited, Downsview, Ontario, Canada

Filed Sept. 4, 1970, Ser. No. 78,343
Int. Cl. F16b *2/20*
U.S. Cl. 287—54 A **9 Claims**

An insert for use in forming a releasable locked joint between a hollow rectangular tubular member and a cubical connector which has at least two spigots of rectangular cross section. The insert fits into the tubular member and has a spigot locking portion at each corner, which bridges the corner of the tubular member to provide a void or cavity in



each corner. The locked joint is established by inserting the spigot into the insert and then turning the tubular member one-eighth to bring the spigot corners into an interference fit with the spigot locking portions.

3,645,570

COUPLING THREAD FOR PERCUSSION DRILL RODS

Ernst Lennart Johansson; Karl Lennart Gosta Lumen, and Hans Per Olof Lundstrom, all of Sandviken, Sweden, assignors to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

Filed Aug. 12, 1970, Ser. No. 63,212
Claims priority, application Sweden, May 4, 1970, 6,062/70
Int. Cl. F16b *7/00*
U.S. Cl. 287—117 **3 Claims**

In a connection between two threaded sections of percussion drill rods held together by a threaded coupling sleeve, the rod threads and sleeve threads have—in longitudinal section—straight flank portions and straight (or only slightly curved) top and bottom portions, the flank portions being connected by curved portions. In coupled state, there is abutting contact (between rod and sleeve threads) only as regards the straight flank portions.

3,645,571

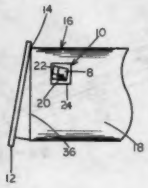
LOCKING MEANS

Walter Lunsford, 5718 Okeechobee Blvd., West Palm Beach, Fla.

Filed Mar. 2, 1970, Ser. No. 15,547
Int. Cl. E05c *19/06*
U.S. Cl. 292—19 **5 Claims**

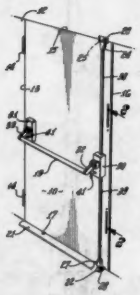
A locking means for a receptacle that includes a container and cap that are moved into a closed position by moving the

cap toward the container opening along a line generally parallel to the centerline of the container opening. The container is opened by removing the cap in the following manner, pivoting one point on the cap about another point on the edge opposite said first point. The locking means includes a male latching means and a female latching means. The male locking means includes a closure cam portion to lock the male locking means in the female locking means, a



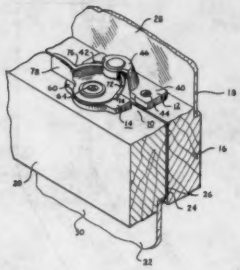
locking abutment located opposite the closure cam portion, and a opening cam portion for unlocking the male locking means from the female locking means. The female locking means includes a cavity for receiving the male locking means. The cavity includes a holding edge to mate with the locking abutment on the male latching means, and a camming edge to be moved by the opening cam portion of the male locking means.

3,645,572
PANIC BAR STIFFENER
William F. McFarlane, Van Nuys, Calif., assignor to Hally Stamping & Manufacturing Company, Los Angeles, Calif.
Filed Aug. 10, 1970, Ser. No. 62,273
Int. Cl. E05c *9/04, 15/02*
U.S. Cl. 292—21 **7 Claims**



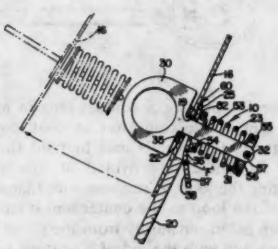
An emergency-exit door provided with a latch mechanism including a panic bar adapted to be pushed to raise upper and lower vertical actuating rods which in turn release upper and lower latch bolts so that the door can be opened. Biasing devices are removably installed in the hinge arms of the panic bar to increase the pressure required to actuate the latch mechanism during times when it is desirable to discourage persons from using the emergency-exit door as an exit from a building when no emergency exists.

3,645,573
WINDOW LOCK
Robert E. Strang, North Liberty, Ind., assignor to The Injection Plastic Co., Inc., Tippecanoe, Ind.
Filed Dec. 11, 1969, Ser. No. 884,222
Int. Cl. E05c *3/04*
U.S. Cl. 292—241 **9 Claims**



A lock for a window of the type having upper and lower vertically sliding sections with frame members at the lower and upper edge, respectively, the lock including a lug member with an inwardly facing shoulder for one window section and an element having an eccentric edge for engaging the shoulder for the other of the window sections. The parts are constructed of a firm but resilient plastic material which offers sufficient yieldability to cause the window to stay firmly locked and to compensate for changes in temperature and moisture without becoming unlatched or loose. A single screw is used to attach the element with the eccentric edge and an insert is preferably used to retain the elements of a base member in place.

3,645,574
FASTENING DEVICE
Thomas J. Scarnato, Barrington; Martin H. Meyer, Elburn, and George B. Cicci, Broadview, all of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Feb. 5, 1970, Ser. No. 8,798
Int. Cl. E05c *3/10, 5/02*
U.S. Cl. 292—242 **1 Claim**



A fastener for securing a hinged door against an adjacent panel and mountable on one of the door and the panel, the fastener being selectively positionable to coact with its mounting to clasp a portion of the other of the door and the panel, wherein the holding force securing the door is nearly constant over a wide range of thicknesses of the portion clasped.

3,645,575

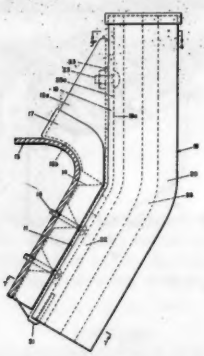
RESILIENT BUMPER GUARD FOR MOTOR VEHICLES

Coleman M. Slavney, 1618 Jefferson Street, Madison, Wis.

Continuation-in-part of application Ser. No. 795,980, Feb. 3, 1969, now Patent No. 3,563,595, dated Feb. 16, 1971. This application Jan. 13, 1970, Ser. No. 2,484

Int. Cl. B60r 19/06, 19/08; B61f 19/04

U.S. Cl. 293—67 10 Claims



A bumper guard assembly for motor vehicles, parking ramps, loading docks, and the like, comprising a channel-shaped mounting bracket and a bumper member. The mounting bracket has spaced V notches in the flanges thereof to facilitate conforming the bracket generally to a desired shape. The bumper member has a baseplate bonded to a resilient element. The baseplate has a substantially longitudinally extending slot and the resilient element has a groove in the rear face thereof communicating with the slot for receiving the head of a mounting bolt for securing the bumper member to the mounting bracket above an attaching lip on the lower end of the mounting bracket.

3,645,576

EYE CONTACT LENS MANIPULATOR

Eugene S. Horres, 1736 Savannah Highway, Charleston, S.C.

Filed May 27, 1970, Ser. No. 40,879

Int. Cl. A61f 9/00

U.S. Cl. 294—1 CA 9 Claims

A device for placing a contact lens in and recovering it from the human eye comprises an oval loop adapted to be placed against the eyelids and to hold them open against blinking. A handle is provided at one end to facilitate manipulating the loop. A resilient wire filament extends from one end of the loop to the center and it carries a knob or a suction cup offset outwardly from the plane of the loop. The knob is adapted with the aid of a wetting agent to support a lens to be placed in the eye. The suction cup is used when it is desired to recover a lens from the eye. Alternatively, the suction cup may be supported directly on the knob. In either case, the knob or suction cup is moved toward the eye with a finger against the resilient tension of the wire filament until either the lens contacts the eye ball or the suction cup contacts a lens in the eye, whereupon it is released leaving the lens in the eye or removing it from the eye as the case may be. When blinking is not a problem, a simplified form of the invention is the form of a bent rod having a handle at one end and a knob or suction cup at the other end.

3,645,577

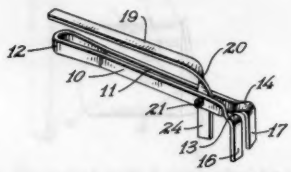
GRIPPER CLAMP FOR SCREEDS

Harvey G. Peper, 633 South Dakota Avenue, New Richmond, Wis.

Filed June 3, 1970, Ser. No. 43,107

Int. Cl. B25b 7/08

U.S. Cl. 294—104 3 Claims



A gripper clamp is provided for facilitating the handling of screeds used in the rough levelling of concrete. The screeds are usually two by fours or two by sixes and are held by workmen at opposite ends. The handling of such screeds is simplified by the use of a gripping tool including a first handle having right angularly extending jaws to engage one side of the screed and a relatively movable handle pivotal relative to the first and having a jaw end engageable with the side of the screed engaged by the first-named jaws.

3,645,578

EASY HOLE DIGGER

Charles L. Renfroe, 506 Coronado Avenue, Roseville, Calif.

Filed Jan. 29, 1970, Ser. No. 6,891

Int. Cl. A01b 1/02

U.S. Cl. 294—50.9 1 Claim

A digging implement for making holes of generally narrow but relatively large depth, the implement comprising a handle supported to a working head, the working head comprising a spade blade that is transversely, centrally divided and connected pivotally free together so that the tip member of the spade blade can be moved between a straight to a perpendicular direction so that it may be used for digging and also raising dirt upwardly from within a hole.

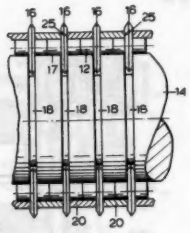
ERRATA

For Classes 297—216 thru 299—5 see:
Patent Nos. 3,645,548 thru 3,645,551

3,645,579
PRESSURE ROLLER APPARATUS FOR ROCK BREAKING

Jacob Marcovitch, Johannesburg, Republic of South Africa, assignor to Rotary Profile Anstalt, Vaduz, Liechtenstein

Filed July 10, 1969, Ser. No. 840,735
Claims priority, application South Africa, Aug. 2, 1968, 68/4996
Int. Cl. E21c *37/04*
U.S. Cl. 299—75 11 Claims

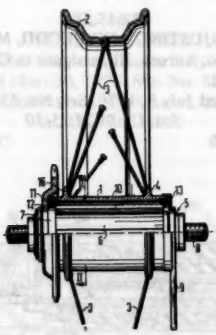


This invention relates to methods of rock breaking which comprise orbiting small rollers around a backing roller that is urged towards the rock face. The rollers each have a raised working zone which is preferably circular in section and which may have hard metal inserts. The rollers may be moved in an arc over the rock face or may be moved stepwise thereof. The working zones apply substantial localized forces to the rock face which forces cause the rock face to break.

3,645,580
WHEEL FOR TWO-WHEEL VEHICLES

Helmut Spies, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Feb. 16, 1970, Ser. No. 11,507
Claims priority, application Germany, Feb. 15, 1969, P 19 07 721.5
Int. Cl. B60b *24/07*
U.S. Cl. 301—55 11 Claims

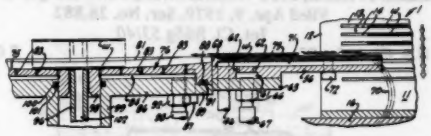


Wheels for two-wheel vehicles, e.g., bicycles and motorcycles, include a hub sleeve and a rim, said hub sleeve and said rim being connected by a plurality of radially extending spokes attached to a spoke attachment sleeve releasably mounted on said hub sleeve.

3,645,581
APPARATUS AND METHOD FOR HANDLING AND TREATING ARTICLES

Cecil A. Lasch, Jr., Mountain View; George H. Bingham, Los Altos; Gerhard Berz, Menlo Park, and Earl G. Troyer, Cupertino, all of Calif., assignors to Industrial Modular Systems Corporation, Cupertino, Calif.

Filed Nov. 26, 1968, Ser. No. 779,033
Int. Cl. B65g *51/02, 60/00*
U.S. Cl. 302—2 R 52 Claims



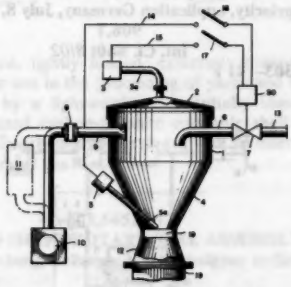
Improved apparatus and method for transporting articles and for centering articles in sequence by means of fluid-bearing devices. The apparatus and method disclosed have particular utility in the handling and treatment of fragile articles, such as silicon wafers, but their utility is not restricted to such use. After centering, the articles are transferred by vacuum means to a spinning unit at which the articles are treated, as by coating the same with a liquid product, such as a photoresist material. Transfer from the spinning unit is by vacuum means.

In a substantially continuous procedure, articles to be treated are withdrawn in sequence from a supply magazine by fluid-bearing structure, moved through the centering and treating steps, and deposited in a discharge magazine by fluid-bearing structure without manual handling during the procedure. The fluid-bearing structure of an alternative embodiment is provided with bidirectional capability.

3,645,582
PROCESS AND APPARATUS FOR FEEDING SOLID PARTICLES UNDER VACUUM

Hans Siemetzki, Bechhausen, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Nov. 16, 1970, Ser. No. 89,903
Claims priority, application Germany, Nov. 25, 1969, P 19 59 015.9
Int. Cl. B65g *53/50, 53/60, 53/66*
U.S. Cl. 302—35 7 Claims



A process and apparatus for feeding a particulate solid material, especially a pulverulent or granular thermoplastic material by gravity flow under vacuum into the feed chamber of a continuously operated screw extruder or similar

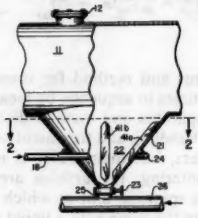
processing apparatus, the apparatus including a single supply container from which the solid material flows into said feed chamber and to which additional solid material is conducted through a signal operated valve which is automatically opened and closed in response to the minimum level of material in the container and the maximum gas pressure in the container, respectively.

3,645,583

APPARATUS AND METHOD FOR HANDLING FINELY DIVIDED SOLIDS

Calvin P. Heath, 2158 Wisteria Street, Baton Rouge, La.

Filed Apr. 9, 1970, Ser. No. 26,882
Int. Cl. B65g *53/40*
U.S. Cl. 302—53 **7 Claims**



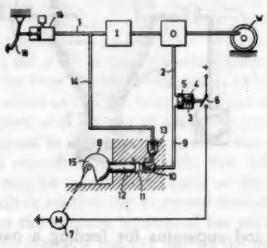
An improved apparatus and method for the discharge, by fluidization and gaseous transport, of finely divided solids from the interior of a storage or transport vessel, such as, for example, a highway bulk transport trailer, or a railway car for similar service. The apparatus includes at least one assembly for providing a fluidizing gas under moderate pressure at the lower boundary of a mass of the finely divided solids in a discharge hopper conventionally forming part of the vessel or tank. The said assembly includes a distributor means and a fabric cover therefor, said cover being characterized in that it has a proportion of looseness, with respect to the gas releasing surface of the distributor means. Upon application of gas pressure to cause flow through said loose cover a vibration is initiated and fluidizing and discharge is accomplished at a greatly accelerated rate.

3,645,584

FLUID RETURN CIRCUIT FOR ANTILOCKING BRAKE SYSTEMS

Heinz Leiber, Leimen, and Fritz Krumling, Leimen-Lingental, both of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed July 8, 1969, Ser. No. 839,905
Claims priority, application Germany, July 8, 1968, P 17 55 906.7
Int. Cl. B60t *8/02*
U.S. Cl. 303—21 F **11 Claims**



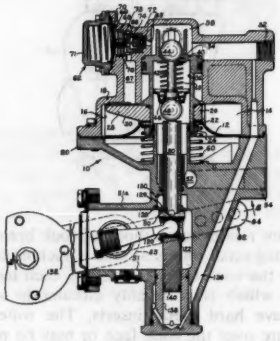
The fluid return circuit in an antilocking control system for vehicle brakes includes a pump constructed to prevent introduction of air into the brake fluid system. The pump is of the positive displacement-type and includes a piston and a drive for the piston. The drive is arranged so that it operates the piston only during the working or pumping stroke and has no effect on the piston during the return or inlet stroke. Instead, the return stroke of the piston is effected only as a consequence of the presence of fluid to be returned.

3,645,585

BRAKE-BALANCING VALVE WITH BRAKE TAPE COMPENSATING MEANS

Brian C. Deem, and Guenter K. Herold, both of Elyria, Ohio, assignors to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Filed Feb. 9, 1970, Ser. No. 9,797
Int. Cl. B60t *8/18*
U.S. Cl. 303—22 R **8 Claims**



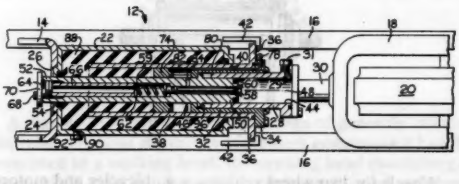
A brake-balancing valve of the type including a constant effective area subject to brake valve pressure and a variable effective area subject to brake chamber pressure, fluid pressure responsive feed valve means for delivering fluid from an inlet to the opposite side of the variable effective area to compensate for brake tare losses whereby the proportioned brakes perform their proper share of braking effort, the feed valve being responsive to the pressure acting on the opposite side of the variable diaphragm whereby a constant compensating pressure is delivered to the opposite side of the diaphragm under all conditions. The invention also includes an improved two-arm articulated lever means which provides over travel for severe axle movement.

3,645,586

TRACK-ADJUSTING AND RECOIL MECHANISM

Donald A. Piepho, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 8, 1970, Ser. No. 53,177
Int. Cl. B62d *55/30*
U.S. Cl. 305—10 **7 Claims**



A track-type tractor comprising an endless track entrained about a drive sprocket and an idler has a self-contained adjuster and recoil mechanism operatively connected to the

idler to maintain a preset tension on the endless track. The recoil portion of the mechanism comprises a compressible material contained in a housing which yieldably urges the idler wheel in a forward direction. The tension in the track may be easily adjusted through the admission of an incompressible fluid into a variable volume chamber to thereby permit easy adjustment of the track tension to accommodate changing conditions of track wear.

3,645,587
DRILL STRING MEMBER AND METHOD FOR MANUFACTURE

Bill G. Parker, 212 Saxon Drive, Lafayette, La.

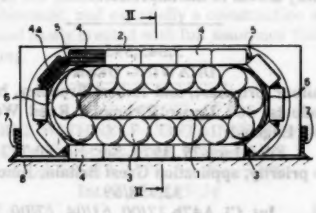
Filed Nov. 18, 1969, Ser. No. 877,754
Int. Cl. F16c *17/00*
U.S. Cl. 308—4 A **9 Claims**

A bottom hole stabilizer, or similar drill string member, is provided with three substantially straight longitudinal ribs on its surface, and the ribs are spaced apart to leave annular flow areas between rib sections. The member is formed as an integral construction by milling flat bottom grooves into a tubular blank having a circular outside periphery when viewed in cross section. The flat bottom grooves are milled into the blank for a sufficient distance to provide substantial annular flow area while also leaving a relatively broad rib section between each annulus area. The member is especially useful for packing a hole just above the drilling bit of a drill string.

3,645,588
ROLLING SLIDES

Guglielmo Pepi, Vico Canavese, Turin, Italy

Filed Mar. 30, 1970, Ser. No. 23,662
Claims priority, application Italy, Mar. 31, 1969, 51224A/69
Int. Cl. F16c *19/00*
U.S. Cl. 308—6 C **7 Claims**

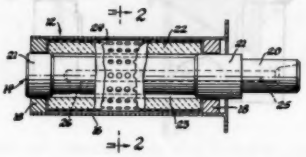


A rolling slide has a bearing body supported by rolling elements which roll both on a closed surface of the body and on an internal surface of an endless belt surrounding the body. The endless belt is made up of a number of resiliently interconnected shoes some of which rest directly on the surface over which the slide moves.

3,645,589
AIR BEARING WITH LOW TENSILE STRENGTH PERMEABLE SLEEVE

Melvyn R. Bird, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1970, Ser. No. 94,855
Int. Cl. F16c *17/16, 13/02*
U.S. Cl. 308—9 **7 Claims**

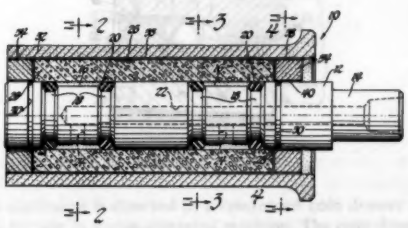


An externally pressurized, gas-bearing roll shell has a low tensile strength, permeable sleeve restricting gas flow to the gas load carrying layer. Three schemes are shown for mounting the permeable sleeve on a stationary mandrel in such a manner that excessive tensile stress is not imparted to the sleeve.

3,645,590
CARBON-GRAPHITE GAS-BEARING ROLL

Melvyn R. Bird, Huron; Paul J. Christiansen, Sandusky, and Philip B. Zeigler, Fort Clinton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1970, Ser. No. 99,159
Int. Cl. F16c *17/16, 13/02*
U.S. Cl. 308—9 **6 Claims**



A high speed, lightly loaded, externally pressurized gas bearing roll for use in the processing of yarns and the like is characterized by a lightweight, substantially impermeable, resin impregnated carbon-graphite rotatable shell mounted on a permeable carbon-graphite sleeve with an interposed externally pressurized gas film.

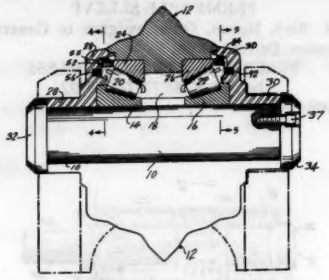
3,645,591
FIXED SHAFT ROTARY SEAL ASSEMBLY

Douglas F. Winberg, Bellevue, Wash., assignor to Subterranean Tools, Inc.

Filed May 8, 1969, Ser. No. 822,920
Int. Cl. F16c *33/76*
U.S. Cl. 308—187.1 **22 Claims**

The disclosure herein relates to a rotary seal assembly, wherein a fixed shaft supports a rotary assembly, such as a cutter assembly for tunnel boring and mining, and the rotary assembly is mounted by antifriction bearings. In order to

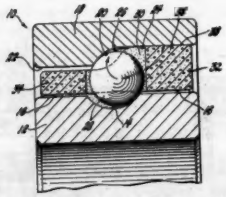
maintain lubricant in the bearing and exclude pieces of material being drilled from the bearings, a seal is provided. This seal is between a metallic ring carried by the rotor, as the outer bearing race of the antifriction bearing, and a graphite ring carried by the stator. The seal is between two relatively slidingly engaging, annular faces or annular seals. The graphite seal is urged toward the metallic ring so as to seat the graphite seal and the metallic ring.



3,645,592
LUBRICANT CIRCULATING ANGULAR CONTACT BALL BEARING

William Kenneth Flandrena, Milwaukee, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 11, 1969, Ser. No. 857,125
Int. Cl. F16c *33/66, 33/38*
U.S. Cl. 308—187 **1 Claim**



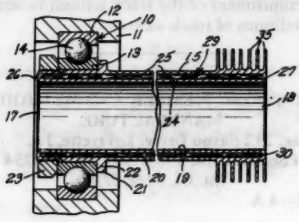
An angular contact bearing having a porous, permeable separator for lubricant circulation is disclosed. The separator includes a cylindrical surface which wipingly engages a cylindrical surface continuous with the raceway on the outer race. The lubricant circulation is from the cylindrical surface of the race through the porous separator to the balls; the balls in turn redistributing the lubricant back to the raceways and cylindrical surface.

3,645,593
HEAT TRANSFER BEARING MOUNTING

Arthur S. Irwin, Bemus Point, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 13, 1969, Ser. No. 865,605
Int. Cl. F16c *37/00*
U.S. Cl. 308—189 **5 Claims**

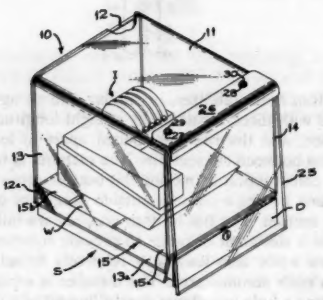
An antifriction bearing assembly mounting wherein the inner ring of the bearing, in the preferred embodiment, is mounted on a hollow sleeve which in turn is mounted on the rotating shaft, the sleeve extends axially along the shaft and is hollow in the manner of an envelope. The interior is filled with a heat conductive material such as sodium and the axial end of the sleeve remote from the bearing has radially outwardly directed cooling fins associated therewith. In this manner, heat created during rotation of the bearing assembly is drawn away from the inner ring of the bearing to a point where it can be effectively dissipated.



3,645,594
ENCLOSURE FOR IMPRINTER SUBJECT TO WEATHER ELEMENTS

Adam Cintz, 1027 Alma Street, Palo Alto, Calif.

Filed Jan. 15, 1971, Ser. No. 106,659
Int. Cl. A47b *81/00*
U.S. Cl. 312—100 **10 Claims**



A boxlike, transparent, rigid, plastic enclosure for an imprinter supported by an outdoor cash stand at a service station having a bottom wall formed to be supported by the cash stand with an imprinter disposed on the enclosure above the cash drawer of the cash stand. One end of the enclosure adjacent to the access for the cash drawer is pivotally attached or removably attached to the top wall of the enclosure to provide easy access to the imprinter.

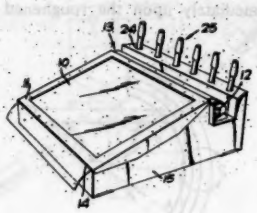
3,645,595
DRAWING DESK

David Balfour Urquhart, and Robert Broadley, both of Ajenda Products, 302 Upper Richmond Road West, London, S.W. 14, England

Filed June 29, 1970, Ser. No. 50,712
Claims priority, application Great Britain, June 30, 1969, 32,958/69
Int. Cl. A47b *27/00, 63/04, 17/00*
U.S. Cl. 312—23 **6 Claims**

A desk is formed from a folded cardboard blank to have a flat top surface. A channel is provided along one edge of the

top surface to receive a roll of paper. A mask is attached to



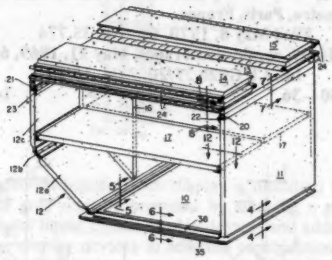
the desk to overlie a marginal area of the top surface and to hold paper drawn from the roll flat against the top surface.

3,645,596

CARGO CONTAINER CONSTRUCTION

Harry M. Russell-French, Philadelphia, Pa., assignor to Boothe Airside Services, Inc.

Filed Dec. 30, 1969, Ser. No. 889,108
Int. Cl. A47b *43/00*; B65d *7/28*
U.S. Cl. 312—258 1 Claim



This application discloses a cargo container construction which provides an erection and knockdown arrangement which keeps the parts together in knockdown condition so that no parts will be lost and so that all parts needed for reerection will be carried by the units handy for use when reassembly is desired; also a construction designed to form a package of minimum size in the dismantled or knockdown condition with full assurance that no parts will be lost and that no components will be crushed or marred if the dismantled packages are stacked on each other or with other goods for return shipment; and especially a construction which can be quickly and easily erected with full assurance that no parts will be missing.

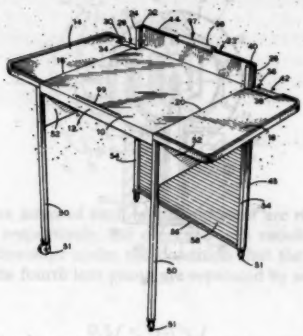
3,645,597

TABLE WITH SELF-CONTAINED COVER

Toshihiko Sakow, 3 Horizon Road, Fort Lee, N.J.

Filed Jan. 23, 1970, Ser. No. 5,249
Int. Cl. E06b *9/14*
U.S. Cl. 312—297 12 Claims

A flat-tabletop-type of work surface can be enclosed with a tambour or rolltop-type of member, which slidably engages upwardly swingable sides or end members, the side edges of the tambour being resistant to being displaced laterally. When the table is in its open position, the tambour extends downward on a track between two legs of the table. When the table is in its closed position, the sides or end members



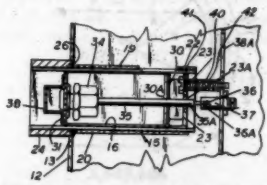
are folded upwardly about the tabletop to a vertical position and the tambour is pulled up, around and over the top of the table, the sides having tracks which slidably engage the sides of the tambour.

3,645,598

REINFORCED COIN DRAWER ASSEMBLY

Harry Greenwald, Whitestone, N.Y., assignor to Greenwald Industries, Inc., Brooklyn, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,100
Int. Cl. A47b *95/00*
U.S. Cl. 312—333 8 Claims



This disclosure is directed to a reinforced coin drawer assembly for use in a coin-operated machine. The coin drawer assembly comprises a sleeve-type housing which is reinforced and a removable coin drawer arranged to slide within the housing. The coin drawer is provided with a lock for securely locking and unlocking the drawer and housing assembly to a frame or cabinet portion of the coin-operated machine.

3,645,599

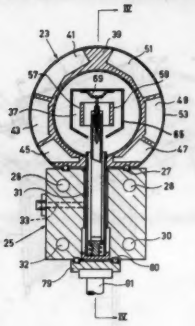
DEVICE FOR UNITING TUBULAR ARTICLES WITH SEALING ELEMENTS IN A GASTIGHT MANNER

Johannes Maria Van Bragt, Emmasingel, Eindhoven, Netherlands

Filed Feb. 17, 1970, Ser. No. 12,052
Claims priority, application Netherlands, Feb. 18, 1969, 6902495
Int. Cl. H01j *7/20*, *9/38*
U.S. Cl. 316—30 6 Claims

An oven device suitable for uniting in a gastight manner a plurality of tubular envelopes of densely sintered material having sealing members at both ends. The oven device can

be made to cooperate with a vacuum system and a gas supply and comprises a U-shaped heating member of graphite where

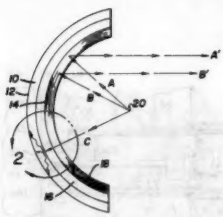


the envelopes, situated in a row between the limbs of the heating member are locally heated.

3,645,600
HEAT ABSORBING REFLECTOR UTILIZING A METALLIC SUBSTRATE

Michael Doctoroff, Rochester; Bernt D. Hoppert, Dansville, and Steven H. Leece, Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 3, 1970, Ser. No. 86,463
Int. Cl. G02b *5/26*
U.S. Cl. 350—1 **6 Claims**



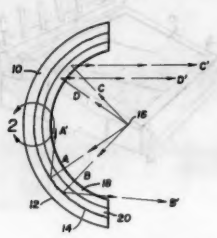
A reflector, for reflecting generally all wavelengths of radiation of visible light from a multilayer interference reflecting coating for generally concentrated projection of the visible light and for absorbing substantially all wavelengths of radiation of heat, is provided for by a metallic substrate having formed thereon, between it and the multilayer interference reflecting coating, an antireflection coating having a continuously graded refractive index for transmission therethrough of wavelengths of heat radiation for absorption into the metallic substrate.

3,645,601
REFLECTOR FOR SPECULARLY REFLECTING VISIBLE RADIATION AND DIFFUSELY REFLECTING HEAT RADIATION

Michael Doctoroff, Rochester; Bernt D. Hoppert, Dansville, and Steven H. Leece, Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 3, 1070, Ser. No. 86,464
Int. Cl. G02b *5/26*
U.S. Cl. 350—1 **9 Claims**

A reflector, for reflecting generally all wavelengths of radiation of visible light for generally concentrated projection of the visible light and for reflecting substantially all wavelengths of radiation of heat in a generally random pattern, is provided for by a metallic substrate having a roughened irregular surface for randomly reflecting wavelengths of radiation of heat. An intermediate layer disposed immediately upon the roughened surface of the

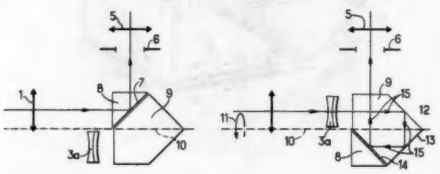


metallic substrate provides an optically smooth base over the roughened surface for deposition of a multilayer interference reflecting coating for reflecting in a concentrated projection generally all wavelengths of radiation of visible light. As a modification the intermediate layer includes impurities for diffusingly reflecting or absorbing heat radiation for added efficiency of heat dispersion.

3,645,602
COMPACT OPTICAL SYSTEM PERMITTING AN INSTANTANEOUS INCREASE IN MAGNIFICATION WITHOUT REFOCUSSING

Serge Clave; , and Marcel Clave, both of 9 Rue Olivier-metra, Paris, France

Filed May 8, 1970, Ser. No. 35,774
Claims priority, application France, May 21, 1969, 6916575
Int. Cl. G02b *21/20, 7/04, 15/00*
U.S. Cl. 350—36 **14 Claims**



Optical system comprising a Barlow amplifier and adapted to make it possible to change the magnification of an image formed by an objective without displacing the image by varying the length of the optical path travelled in dependence upon the enlargement of said image. This optical device is characterized by the fact that it comprises an assembly of reflecting plane surfaces some of which are pivotally mounted so as to permit an increase in the number of reflections undergone by said rays at the same time as said magnification. The device is particularly applicable to telescopes and to binoculars, which may be provided with means for increasing their stereoscopic effect.

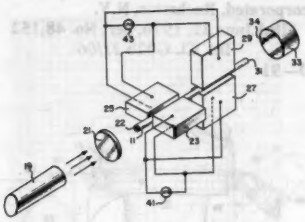
3,645,603
LIGHT MODULATION IN OPTIC FIBER

Luther W. Smith, 5 Bridges Road, Brimfield, Mass.

Filed Sept. 24, 1969, Ser. No. 860,748
Int. Cl. G02f *1/24*; **G02b** *5/14*
U.S. Cl. 350—149 **14 Claims**

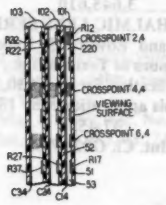
Light is modulated in an optic fiber by applying compression across diameters of the fiber angularly displaced from

one another and axially displaced from one another along the fiber. Independent phase modulation is achieved by varying the compression applied across the diameters equally and



with the same direction. Independent amplitude modulation is achieved by varying the compression applied across the diameters equally and with opposite polarity directions.

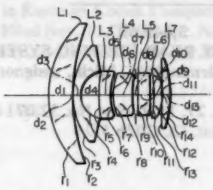
3,645,604
LIQUID CRYSTAL DISPLAY
Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 10, 1970, Ser. No. 62,282
Int. Cl. G02f 1/28; G09f 11/00
U.S. Cl. 350—160 **12 Claims**



An improved liquid crystal display is disclosed in which a multilevel gray scale is provided by stacking a plurality of conventional liquid crystal display devices and addressing the respective display devices in selected combinations. Successive display devices in the stack are of different thicknesses or of different material composition, such that with like magnitude signals applied thereto, each display scatters light by a different predetermined amount. A single addressing circuit is employed in common for all of the display devices, with respective bits of a multibit gray scale codeword determining the energization of the individual display devices in the stack.

3,645,605
ULTRAWIDE-ANGLE PHOTOGRAPHIC OBJECTIVE LENS
Jihei Nakagawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed July 23, 1970, Ser. No. 58,451
Claims priority, application Japan, Aug. 4, 1970, 44/61183
Int. Cl. G02b 9/62, 9/64
U.S. Cl. 350—214 **3 Claims**

Ultrawide-angle photographic objective lens having a back focus or rear focal length of about 1.2–1.3 times the focal length of the entire system, an aperture of 1/3.5 and an angle of field of 90°. The objective lens comprises seven lens groups, the foremost first to fourth lens groups of which inclusive constitute the forward lens groups of a negative power adapted to form a virtual image of the object while the fifth to seventh lens groups constitute the rearward lens groups adapted to form a real image from the virtual image. Assuming that the focal length of the entire system is *f*, the focal length of the respective lens group is *fi* (*i*=1,2,—) and the radius of curvature of the respective surface of each lens group, the thickness of each lens component or airgap and



the refractive index of each lens component are *ri*, *di* and *ni* (*i*=1, 2,—) respectively, the objective lens satisfies the following relationships under the condition that the third lens group and the fourth lens group are separated by an airgap:

(1) $0.5f < |f_2| < f$

(2) $\sum_{i=1}^{i=7} di < f$

(3) $0.2f < r_6 < f$

$0.2f < r_7 < f$

(4) $0.2f < d_5 + d_7 < 0.4f$

while the objective lens satisfies the following relationships when the third and fourth lens groups are cemented with each other:

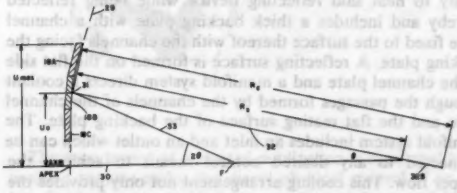
(1) $0.5 < |f_2| < f$

(2) $\sum_{i=1}^{i=6} di < f$

(3) $0.2f < r_6 < f$

(4) $0.2f < d_5 + d_6 < 0.4f$

3,645,606
MULTIFACET SUBSTANTIALLY PARABOLOIDAL COLLIMATOR AND METHOD FOR MAKING SAME
Allan D. La Vantine, Tarzana, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Original application July 26, 1967, Ser. No. 656,093, now Patent No. 3,494,231. Divided and this application Jan. 12, 1970, Ser. No. 2,026
Int. Cl. G02b 5/10; B23p 19/00
U.S. Cl. 350—292 **2 Claims**



A light reflecting collimator having a substantially paraboloidal surface and being formed of a plurality of juxtaposed facets each having a substantially paraboloidal surface.

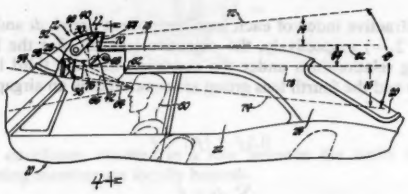
A method for making such a collimator of a plurality of facets each having a substantially paraboloidal surface on individual plates and each facet formed on each plate being defined by two paraboloidal radii lying in orthogonal planes.

3,645,607

SPLIT IMAGE REAR-VIEWING SYSTEM

Donald R. Whitney, Birmingham, Mich., assignor to General Motors Corporation

Filed Apr. 27, 1970, Ser. No. 32,071
Int. Cl. G02b 5/08
U.S. Cl. 350—301 4 Claims



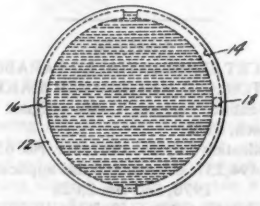
A split image rear-viewing system for a motor vehicle includes a primary mirror mounted adjacent the vehicle roof which provides a lower sight path looking directly through the vehicle windows and an upper sight path looking over the roof through a rearwardly facing periscope. The individual sight paths are optically separated by a narrow occulted strip but blend into a single observed image rearwardly of the vehicle due to the pupillary diameter of the observer's eyes.

3,645,608

COOLING MEANS FOR REFLECTING DEVICE

Charles F. Staley, Lake Park, and Fredrick J. Staudt, Riviera Beach, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation of application Ser. No. 804,386, Mar. 3, 1969. This application May 5, 1970, Ser. No. 34,672
Int. Cl. G02b 5/08
U.S. Cl. 350—310 7 Claims



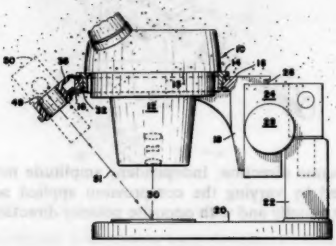
This reflecting device is for use with beams having the ability to heat said reflecting device while being reflected thereby and includes a thick backing plate with a channel plate fixed to the surface thereof with the channels facing the backing plate. A reflecting surface is formed on the flat side of the channel plate and a manifold system directs a coolant through the passages formed by the channels of the channel plate and the flat mating surface of the backing plate. The manifold system includes an inlet and an outlet which can be connected to any desired control means to achieve the proper flow. This cooling arrangement not only provides the cooling necessary to maintain the reflecting device in an operating condition but also maintains the high quality of the reflecting surface. The invention herein described was made in the course of or under a contract with the Department of the Air Force.

3,645,609

ACCESSORY MOUNTING MECHANISM FOR A MICROSCOPE

Robert W. Holmes, Perinton, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed June 22, 1970, Ser. No. 48,152
Int. Cl. G02b 21/06
U.S. Cl. 350—91 3 Claims



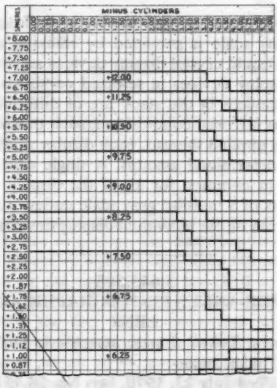
A groove, or pocket, is formed between two members for holding an optical head of a microscope and a tab member fits lockably into the pocket so formed, for retaining a microscope accessory. At least one of the two pocket-defining members is demountable. Means may be employed to adjust the angular position of said accessory.

3,645,610

OPHTHALMIC LENS SERIES

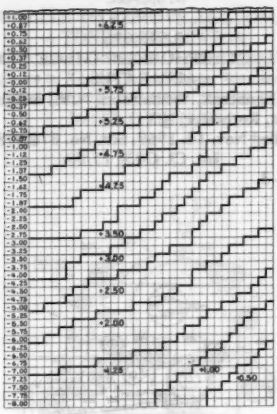
Frank E. Duckwall, and Edward J. Labelle, both of Indianapolis, Ind., assignors to Textron, Inc., Providence, R.I.

Continuation of application Ser. No. 630,336, Apr., 1967, now abandoned. This application May 18, 1970, Ser. No. 37,455
Int. Cl. G02c 7/02
U.S. Cl. 351—159 1 Claim



A new and improved method of designing an ophthalmic lens series and a new and improved ophthalmic lens series. The method takes into consideration numerous factors affecting lens performance and by means of systematic calculations and graphical analysis provides the lens designer with a means for determining, for any given prescriptive power, the lens shape which will provide optimum visual acuity at angles of viewing up to 40° from the optical axis of the lens, simultaneously giving consideration to tangential and sagittal power errors, errors of astigmatism, variations in stop distance, ability of the eye to accommodate for certain errors, lens thickness, visual tasks of the wearer determined by

statistical techniques, and many other factors. The lens series may cover the entire range of ophthalmic prescriptions and provides lenses having increased visual acuity over the whole



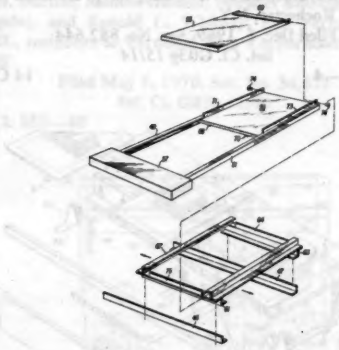
area of the lens including angles of view up to 40° from the optical axis of the lens. A comparatively small number of groups of lenses are used, each group having one base curve identical for all lenses of the group.

3,645,611

PRECISION PLANER POSITIONING MECHANISM

Warren H. Smith, Marietta, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 6, 1969, Ser. No. 822,231
Int. Cl. G03b *1/48, 23/08*
U.S. Cl. 353—23 2 Claims



This disclosure describes a precision planer positioning mechanism for positioning a microfiche in an optical viewing or projecting mechanism having a vertical projection axis. The positioning mechanism comprises: a glass plate fixedly mounted in a horizontal plane so that the glass plate intersects the projection axis of the optical system; and, a holder for holding microfiches and moving them through the projection axis. The holder includes nylon or other suitable plastic runners that rest on the glass plate. The runner in combination with the glass plate allow the microfiche to be moved through the projection axis without changing the focal distance between the projection lens and the microfiche as different microfiche images are moved into the projection axis.

3,645,612

READER FOR INFORMATION CARRIERS IN SHEET FORM

Heinz Streicher, Echterdingen; Siegfried Riek, Esslingen-Weil, and Manfred Leutwein, Rommelshausen, all of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 12, 1969, Ser. No. 875,791
Claims priority, application Germany, Nov. 16, 1968, P 18 09 313.5
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 15 Claims

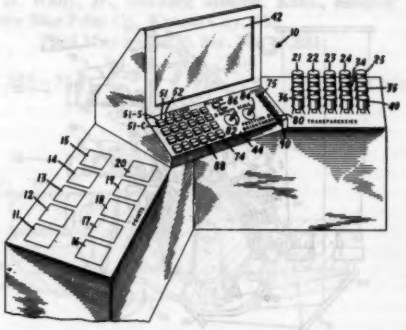
Apparatus is disclosed for projecting images derived from information-bearing media (or information carriers) including first and second stations (or magazines) for receiving a plurality of the image-bearing media, a feed path disposed between the first and second stations, first and second lens means for projecting images derived from two information-bearing media and a storage station disposed with respect to the feed path for receiving and storing information bearing media.

3,645,613

EDITORIAL LAYOUT PROJECTOR

Robert M. Brink, New Canaan, and Paul E. Welch, Riverside, both of Conn., assignors to Time, Incorporated, New York, N.Y.

Original application June 3, 1968, Ser. No. 734,074. Divided and this application June 18, 1970, Ser. No. 47,269
Int. Cl. G03b *21/00*
U.S. Cl. 353—121 1 Claim



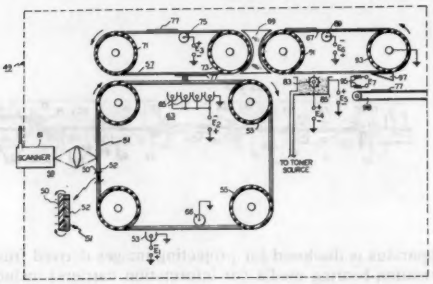
The page layout of a printed publication is simulated by an imaging process under the direct physical control of an editor. Controls are provided for selecting pictures and bogus type for simultaneous display on a screen in a simulated layout and for instantaneously cropping, rotating, scaling, positioning, and adjusting brightness levels so that the editor can immediately see and evaluate changes in layout.

3,645,614

APERTURE-CONTROLLED ELECTROSTATIC PRINTING SYSTEM EMPLOYING ION PROJECTION

Samuel B. McFarlane, Jr., Summit, N.J.; Joseph Burdige, Spring Valley, and Norman E. Alexander, Scarsdale, both of N.Y., assignors to Electroprint, Inc., Palo Alto, Calif.

Filed Mar. 1, 1968, Ser. No. 709,578
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 12 Claims



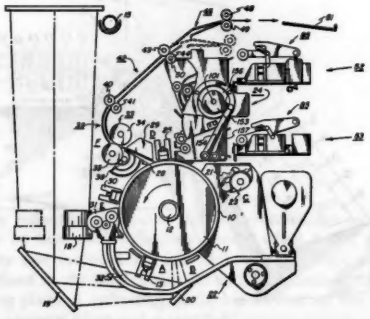
Methods and apparatus for electrostatic printing including a multilayer screen having a conductive layer and an insulative layer and having apertures therein, means for deploying opposite electrostatic charges across the insulative layer, an image projecting system for modulating the charge on the insulative layer in accordance with light received thereby, a Corotron or other like means for projecting ions through unblocked apertures in the screen and through partially blocked apertures in the screen in fewer numbers to a substrate for subsequent developing and fixing to provide both positive and negative reproductions.

3,645,615

COPYING APPARATUS

Merton R. Spear, Jr., Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 3, 1969, Ser. No. 838,953
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 9 Claims



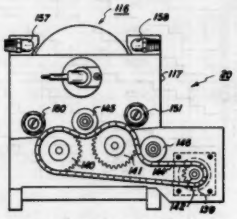
A copying apparatus capable of being selectively operated to feed individual cut sheets of final support material from one of a plurality of supply trays through a series of sheet processing stations to form a simplex image of an original thereon. A second mode of operation is provided wherein copy sheets fed from a first supply tray are simplexed and then automatically delivered to a second supply tray where the sheets are stored in an orientation wherein the sheets can be refed through the processing stations. The original is then changed and the image-bearing sheets fed from the second supply tray through the sheet processing apparatus to create a duplexed image on the reverse side thereof.

3,645,616

PHOTOELECTROPHORETIC IMAGE TRANSFER APPARATUS

Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,978
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 7 Claims



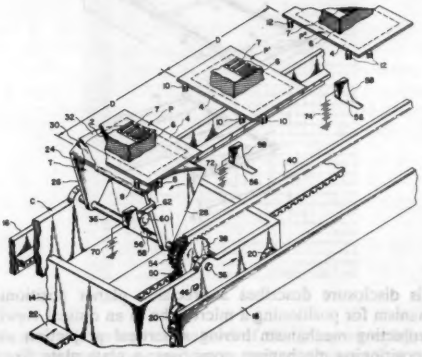
A web-handling system is used for feeding a web from a spool to an output roller. The web is dispensed from the spool by a control mechanism responsive to slack in the web. The slack in the web is taken up by a pinch feed mechanism that includes a flat plate traveling past the output roller. The web is used to receive an image formed on the flat plate from a photoelectrophoretic ink exposed to electromagnetic radiation and subjected to electric fields.

3,645,617

MULTIPLE IMAGE TRANSFER DEVICE

John S. Pollock, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,644
Int. Cl. G03g *15/14*
U.S. Cl. 355—4 14 Claims



A device for transferring electrostatic toner images to a receiver is provided wherein a receiver is attached to a roller segment having a relatively large diameter. The roller segment is mounted in a carriage for movement along a path past a plurality of image transfer stations. A cycloidal cam surface controls rotational movement of the roller segment so that the toner images are transferred to the receiver substantially without smearing. The relatively large diameter of the roller segment assures a longer contact time at each sta-

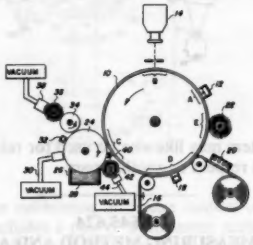
tion to assure more complete transfer than would result with a smaller radius transfer roller or roller segment.

3,645,618

VACUUM NOZZLE TO REMOVE AGGLOMERATES ON A TONER APPLICATOR

Fredrick Lancia, and Gerald L. Miller, both of Columbus, Ohio, assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1970, Ser. No. 99,556
Int. Cl. G03g 15/00
U.S. Cl. 355—15 20 Claims



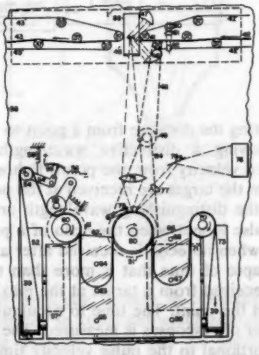
Development method and apparatus employing a donor member adapted to retain toner on its periphery and a number of processing stations arranged around its periphery, including a toner loading station having means to load toner on the peripheral surface of the donor member, and a toner layer preparation station having means to prepare the toner layer on the donor member prior to presentation of the toner layer to the imaged region of a photoconductor development station.

3,645,619

DOCUMENT CAMERA SYSTEM

John S. Burton; Samuel Gilman; Michael Rothbart, all of Los Angeles, and Ronald L. Whitney, San Fernando, all of Calif., assignors to Terminal Data Corporation, Van Nuys, Calif.

Filed May 5, 1970, Ser. No. 34,671
Int. Cl. G03b 15/00
U.S. Cl. 355—40 12 Claims



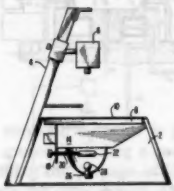
A filmstrip-recording system for making optical exposures upon film of documents translated by a belt in continuous motion. The film is rapidly started and stopped for each exposure. The exposure is made while the document and the film are both moving synchronously. Indicia having positional significance are applied while the film is in motion, and indicia having human-readable significance are applied while the film is stationary. Under the control of a coactive computer, documents are selectively sensed for recording or for not recording, and as to the specific identity of the human-readable indicia that shall be applied. Electronic timing and control circuits, including ramp function elements, are employed to achieve approximately an order of magnitude greater speed of operation than state of the art devices.

3,645,620

PHOTOGRAPHIC SLIDE COPYING APPARATUS

Daniel L. Jaffe, 5708 Beech Avenue, Bethesda, Md.

Filed June 25, 1969, Ser. No. 836,320
Int. Cl. G03b 27/76
U.S. Cl. 355—63 2 Claims



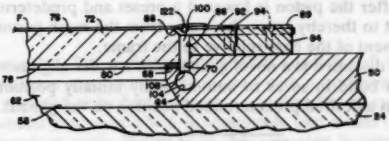
A photographic copying apparatus utilizing a housing with an opening therein which is adapted to receive a photographic transparency to be copied by a copying camera mounted exterior to the housing. Within the housing, there is an electronic flash unit mounted within a cup-shaped reflector at the apex of which there is supported an illuminating viewing lamp having a variable intensity control for compensating for tonal differences in the transparencies. The flash unit, the illuminating lamp, the opening and the camera lens are all in alignment and when the flash unit is energized, it throws up a highly uniform pattern of light to the transparency by virtue of the combined diffusing surfaces of the spherical view lamp and the cup-shaped reflector.

3,645,621

CAMERA-PROJECTOR WITH VACUUM FILM PLATEN

Joseph H. Wally, Jr., Shawnee Mission, Kans., assignor to Western Blue Print Co., Kansas City, Mo.

Filed May 27, 1970, Ser. No. 40,881
Int. Cl. G03b 27/64
U.S. Cl. 355—76 18 Claims

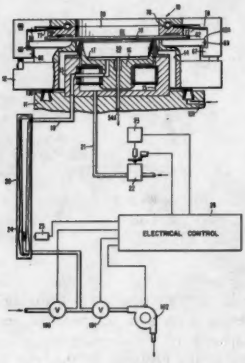


Camera-projector having a frame-enclosed transparent platen supported on the first surface of its condenser, the peripheral edge of the platen being spaced from the frame to provide a continuous channel thereabout which is connected to an evacuating pump. The frame has registration pins by which film is located on the platen with its margin over the channel, and the edge of the platen is notched at spaced intervals to promote vacuum pull down of the film flat against the platen surface.

3,645,622
METHOD AND APPARATUS FOR ALIGNING A PHOTOMASK

Rene P. Cachon; Forrest R. Grundon, both of Wappingers Falls; Frank H. Masterson; Joseph C. Miller, both of Poughkeepsie, and Fred E. Wustrau, Accord, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,257
Int. Cl. G03b *27/02*
U.S. Cl. 355—132 **26 Claims**



Apparatus and method for accurately aligning a semiconductor wafer to a photomask, comprising a base and a frame for the apparatus. The base portion includes a chamber in which is mounted a piston which is restrained from lateral movement while permitting vertical reciprocation thereof. In the upper portion of the piston is a socket which supports a gimbal, the gimbal including a surface for receiving a wafer thereon. Mounted on the frame is a carriage which includes a mask clamp for positioning a mask in superimposed overlapping relation relative to the gimbal while clamping the mask to the frame. A source of fluid is connected to the socket so that the gimbal will float on a cushion, for example, of air. The piston is elevated by air pressure to cause the piston to raise beyond the point of contact of a wafer mounted on the gimbal with the mask. In response to the increase in fluid pressure which results from the contact of the wafer with the mask a sensor stops the air pressure to piston. Thereafter the piston is lowered a preset and predetermined amount to thereby space the wafer from the mask permitting adjustment of the base relative to the frame.

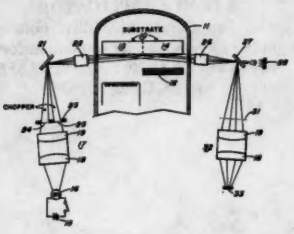
Also disclosed is a novel gimbal with a wafer alignment apparatus build in so as to automatically initially position the wafer in a desired predetermined position on the gimbal.

3,645,623
APPARATUS FOR MONITORING FILM THICKNESS BY REFLECTING A LIGHT BEAM FROM THE FILM SURFACE

Raymond A. Patten, 8612 Madison Place, Oxon Hill, Md.

Filed Sept. 25, 1970, Ser. No. 75,520
Int. Cl. G01b *11/06, 11/14*
U.S. Cl. 356—1 **10 Claims**

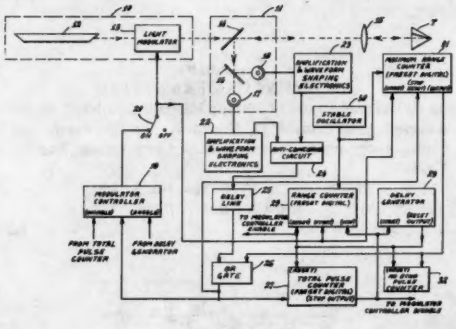
This disclosure is directed to a nondestructive test system which makes use of a reflected light beam to determine the thickness of a film deposited onto a substrate within a vacuum system. The thickness of the film is monitored during deposition without any deleterious effects on the film deposition. The system may likewise be used for relative position of one part with respect to another part.



3,645,624
RANGE-MEASURING METHOD AND APPARATUS

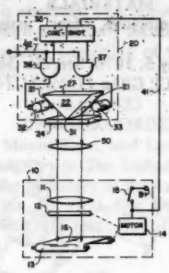
Stanley Schenkerman, Mamaroneck, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed July 7, 1970, Ser. No. 52,971
Int. Cl. G01c *3/08*
U.S. Cl. 356—5 **10 Claims**



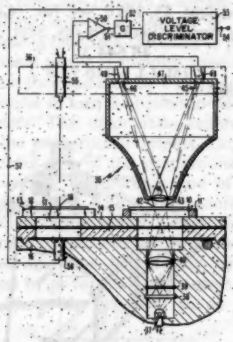
For measuring the distance from a point to a target a pulse of energy having a distinctive wavelength is sent at a predetermined velocity from the point. Echoes of the pulses reflected from the target are received at the point and echoes having only the distinguishing wavelength are processed. A successive pulse is sent when the echo of a previous pulse is received, or when no echo is received after a predetermined maximum elapse of time that is more than the time for an echo to be received from a target at the maximum expected distance from the point. The time to accumulate a predetermined number of responses is measured. The target distance is then proportional to the pulse velocity times one-half the time interval between the sensing of the first pulse and, either the receipt of the last echo or the elapse of a predetermined maximum time after the sending of the last pulse, less the total time of any such predetermined maximum elapses of time, divided by the total number of pulses sent less the number sent in response to any said maximum elapses of time. The foregoing steps eliminate errors due to noise and to echoes that are too weak to be received.

3,645,625
TEST DEVICE FOR AN IMAGE MOTION COMPENSATION AERIAL CAMERA
Karl Leistner, RFD 1, P.O. Box 117, Eatontown, N.J.
Filed Dec. 22, 1970, Ser. No. 100,739
Int. Cl. G01p 21/00
U.S. Cl. 356—27 7 Claims



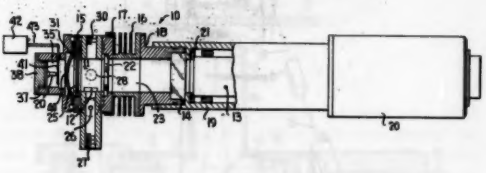
The device for calibrating an image motion compensation aerial camera includes a pair of transparent scales formed on an enclosure having two light tight compartments, one for each scale. Each compartment contains a flash lamp which is energized at specifically spaced intervals determined by a one-shot multivibrator. During a test, the camera photographs a superposition of the two scales while the film is in motion. The amount of displacement between the photographed scales will indicate the velocity of the film.

3,645,626
APPARATUS FOR DETECTING DEFECTS BY OPTICAL SCANNING
William O. Druschel, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 15, 1970, Ser. No. 46,093
Int. Cl. G06k 9/08
U.S. Cl. 356—71 25 Claims



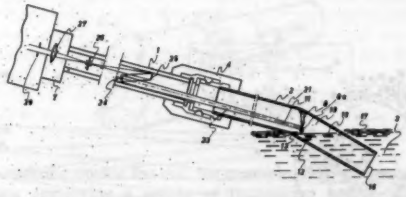
Apparatus for detecting defects in optically discernible patterns on substrates. In apparatus which compares the optically discernible patterns in a pair of regions by coincidentally scanning said regions with a pair of optical sensing members in order to detect differences in the coincidentally sensed data, there is provided a control pattern and a third optical sensing means for scanning the control pattern along a path coincident with the scan paths of the first two sensing means. The control pattern contains optical indicia. When the third sensing means senses one of these optical indicia it activates means which interrupts the comparison of the data sensed by the pair of sensing means.

3,645,627
CALIBRATION SYSTEM FOR PHOTODETECTING INSTRUMENTS
Samuel S. Brody, Springfield, and William B. Holland, Vienna, both of Va., assignors to Melpar Inc., Falls Church, Va.
Filed Apr. 14, 1969, Ser. No. 815,711
Int. Cl. G01j 3/30, 3/48
U.S. Cl. 356—87 11 Claims



A photometric emission detector is provided with an integral calibration source including a source of light and apparatus for controlling the passage of light and the quantity of light passed along the optical path via which induced radiant energy emissions are detected when the detector is in use.

3,645,628
APPARATUS FOR DIRECT SPECTROMETRIC ANALYSIS OF MOLTEN SUBSTANCES
Milan Bojic, 87 bis, rue Georges Ducrocq, 57 Metz, and Daniel Jorre, 58 bis, rue Ivan Tourgueniev, 78 Buogival, both of France
Filed Jan. 29, 1971, Ser. No. 110,998
Claims priority, application France, Feb. 5, 1970, 7004032
Int. Cl. G01j 3/30
U.S. Cl. 356—86 16 Claims

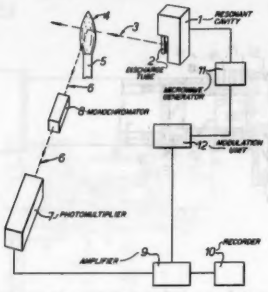


Apparatus for direct spectrometric analysis of molten metals has a spectrometer connected with a light-conveying tube provided at its free end with a coupling for an expendable tubular extension which is immersible into a bath of molten metal. A main electrode in the extension is connected with a spark generator by way of the tube and the generator produces a spark between the electrode and the surface of molten metal in the extension when the distance between such surface and the electrode is within a desired range. The light which is produced in response to generation of the spark is conveyed by an optical system in the tube and is analyzed in the spectrometer. The distance between the electrode and the surface of molten metal in the extension can be regulated by changing the pressure of an inert gas which is circulated in the extension above the surface of molten metal to evacuate metallic vapors which develop in response to generation of the spark.

3,645,629
APPARATUS FOR SPECTROSCOPIC ANALYSIS WITH MODULATED ELECTRODELESS DISCHARGE TUBE

Roy Maurice Dagnall, Chalvey, Slough, England, assignor to Technicon Corporation, Tarrytown, N.Y.

Filed July 3, 1969, Ser. No. 838,975
Int. Cl. G01j 3/30
U.S. Cl. 356—85 11 Claims

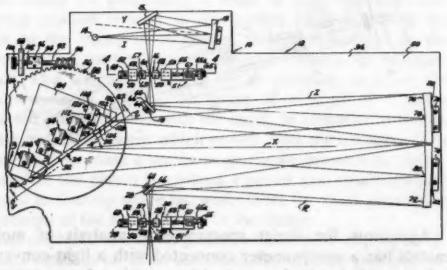


A gas, or electrodeless, discharge lamp for use in spectroscopic analysis is excited in a microwave field of sufficiently high intensity to maintain a high-residual ion concentration within said lamp to reestablish the discharge therein with minimal delay. Also, the microwave field exciting the lamp is modulated, whereby the emission, or beam, from the lamp irradiating an atomic vapor is modulated in "on-off" fashion without physical obstruction of said beam.

3,645,630
MONOCHROMATOR

Harry S. Newcomer, P.O. Box 340, Cape May, N.J.

Original application Jan. 20, 1964, Ser. No. 338,744, now Patent No. 3,428,391, dated Feb. 18, 1969. Divided and this application Jan. 22, 1968, Ser. No. 699,497
Int. Cl. G01j 3/14
U.S. Cl. 356—100 1 Claim

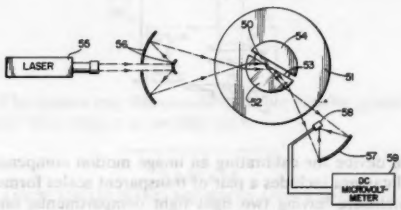


This compact monochromator employs two concave collimating mirrors of different sizes mounted off-axis adjacent one another edge-to-edge in such a manner that the central ray of the larger dispersed light collimating mirror makes a larger acute angle relatively to the entrance face of the dispersing prism array than the central ray of the incident-light collimating mirror makes thereto. This insures that the collimating mirrors cover the full aperture of the dispersing prism array yet at the same time obtains the most compact monochromator housing. Incident light from a light source is transmitted through an entrance slit at one side of the monochromator and reflected by an incident-light reflector to the smaller incident-light collimating mirror, whereas dispersed light from the larger dispersed-light collimating mirror is reflected by a dispersed-light reflector through an exit slit at the opposite side of the monochromator.

3,645,631
APPARATUS AND METHOD FOR MEASURING THE CARRIER CONCENTRATION OF SEMICONDUCTOR MATERIALS

Dinesh C. Gupta, Cambridge, Mass., assignor to GTE Sylvania Incorporated

Filed May 5, 1970, Ser. No. 34,700
Int. Cl. G01n 21/46, 21/34
U.S. Cl. 356—136 10 Claims

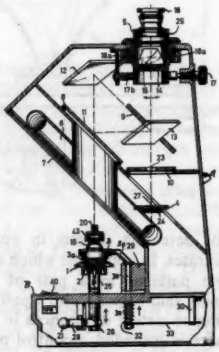


Technique of measuring the free carrier concentration in a silicon specimen by passing a beam of infrared or far infrared energy from a laser through a body of intrinsic germanium to impinge on a surface of the silicon specimen which contacts the germanium at an optically flat interface. The angle of incidence is varied until substantially all of the incident radiation is reflected and detected by a photodetector. This angle of incidence is designated the critical angle and is a measure of the carrier concentration of the silicon specimen.

3,645,632
DEVICE FOR THE ADJUSTMENT OF A RAW-EDGED LENS WITH RESPECT TO AN OUTLINE PATTERN OF ITS MOUNT

Wilhelm Schmidt, Aalen, and Erwin J. Daniels, Konigsbronn, both of Germany, assignors to Carl Zeiss Stiftung, Wuerttemberg, Germany

Filed Sept. 23, 1970, Ser. No. 74,614
Claims priority, application Germany, Sept. 26, 1969, P 19 48 644.3
Int. Cl. G01b 9/08
U.S. Cl. 356—165 9 Claims



The device of the invention is used for the adjustment of a raw-edged spectacle glass between two supports with respect to an outline pattern conforming to the mount or frame into which the edge-ground spectacle glass is to be fitted. An opti-

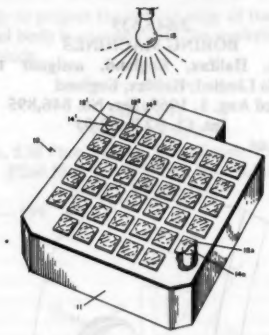
cal system contains a transparent slidably adjustable scale plate in the plane of which is projected the image of an outline pattern and an image of the spectacle glass, the edge of which is to be ground in accordance with the outline of the outline pattern. The spectacle glass is placed between two supports which engage the two faces of the spectacle glass; the spectacle glass is slidably adjusted between these supports until the image of the spectacle glass appears within the outline of the image of the outline pattern in the plane of the scale plate which is observed by a telescope ocular. The scale plate is provided with a centrally located adjusting mark and two coordinate systems consisting of two sets of uniformly spaced parallel lines.

3,645,633

CHROMACORDER

Paul J. Kisatsky, Mount Fern, and Louis R. Szabo, Landing, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 11, 1971, Ser. No. 105,385
Int. Cl. G01j *3/46, 3/48;* **G01j** *3/50*
U.S. Cl. 356—177 **10 Claims**



An instrument for the instantaneous measurement of the chromaticity of time variant spectral sources including a plurality of narrow band sensors or transducers that in combination encompass the visible spectrum. Each consists of an interference filter and a linear photovoltaic cell whose three output voltages have been "optimum multiplied" for the three tristimulus functions through a voltage divider network. The corresponding individual outputs of the sensors are added by a summing feedback amplifier to provide a voltage output proportional to the tristimulus values. These proportional outputs are then summed by a unity gain summing amplifier whose output in turn is applied to one input of a pair of ratio recorders. The other ratio recorder inputs each receive one of the proportional outputs. Each ratio recorder inputs each receive one of the proportional outputs. Each ratio recorder output, therefore, is one of the normalized chromaticity coordinates. The output coordinate values (x and y) are simultaneously fed into a chart recorder to derive a plot of the chromaticity coordinates vs. time.

The invention described herein may be manufactured, used and licensed by or for the Government for governmental purposes without the payment to us of any royalty thereon.

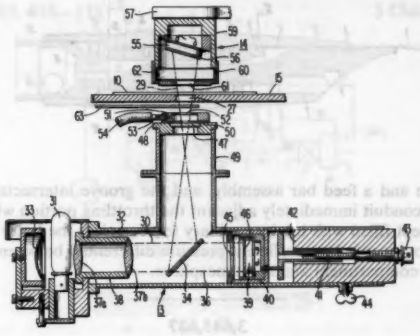
3,645,634

APPARATUS FOR MEASURING LIGHT TRANSMISSION OF A SEMITRANSPARENT MEMBRANE

Jean Bertolet Bucher, Lancaster, Pa., assignor to RCA Corporation

Filed May 14, 1970, Ser. No. 37,215
Int. Cl. G01n *21/30*
U.S. Cl. 356—201 **8 Claims**

An apparatus, including a light-beam-producing means, a means for splitting the bean into a measuring beam and a reference beam, a reference photocell in the path of the reference beam, a measuring photocell having a substantially flat window in the path of said measuring beam for producing a measured signal, a means for holding the semitransparent membrane in the path of the measuring beam, and means for comparing the reference signal with the measured signal for producing an output signal. The window is mounted at an angle with respect to the path of the measuring beam to deflect any reflected light away from the path of the measuring beam. A shutter may be positioned in the path of the measuring beam. In one form of the apparatus, the light source, beam splitter and reference photocell are enclosed in a dusttight enclosure having an exit window for transmitting the measuring beam. A means for producing a turbulent flow of clean gas in front of the exit window may be provided.

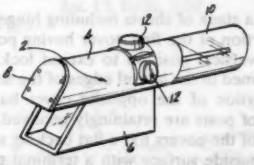


3,645,635

SIGHTING DEVICE

William F. Steck, El Paso, Tex., assignor to W. R. Weaver Company

Filed May 5, 1970, Ser. No. 34,665
Int. Cl. G02b *23/10*
U.S. Cl. 356—252 **4 Claims**



A sighting device for use, for example, with a shotgun, the device employing a reticle of fluorescent acrylic polymer disposed out of the field of view. The image of the reticle is projected into the field of view by a preferably dichroic partial reflector. Windage and elevation adjustments are included for moving the reticle to zero in the device on the target in the field of view.

3,645,636

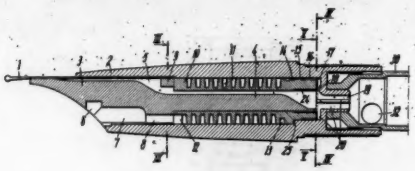
INK FLOW CONTROL IN A FOUNTAIN PEN

Otto Mutschler, Ludolf-Krehl-Strasse 21, Heidelberg, Germany

Filed Dec. 3, 1970, Ser. No. 94,836
Claims priority, application Germany, Apr. 11, 1970, P 20 17 353.9
Int. Cl. B43k *5/18*
U.S. Cl. 401—227 **10 Claims**

Flow of ink from a storage compartment to the writing point of a fountain pen is controlled by a throttling portion in the air conduit which admits air to the ink compartment dur-

ing writing. This portion is kept filled with air by a system of capillary ducts including three or more radial ducts in a front face of a partition which separates the compartment from the cavity in the front part of the pen barrel. The ducts communicate with an annular groove between the inner barrel surface and a feed bar assembly, and the groove intersects the air conduit immediately adjacent the throttling portion which is kept filled with ink by capillary forces unless the latter can be overcome by a sufficient pressure differential between the ink compartment and the atmosphere.

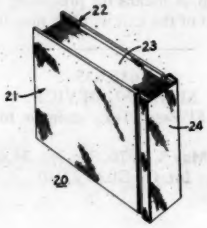


3,645,637

BOOKBINDER

Arthur R. Gustafson, Norridge, Ill.

Filed Apr. 22, 1970, Ser. No. 30,779
Int. Cl. B42f *13/08*
U.S. Cl. 402—15 9 Claims



A binder for a stack of sheets including hinged covers with the binding portion of the first cover having posts which are bendable into vertical position to extend lockingly through aligned slits formed in the lateral edges of the sheets and with the binding portion of the opposite cover having loops in which the tips of posts are retainingly received. The binding portion of one of the covers has a flat backing sheet of metal secured to its outside surface with a terminal portion which flatly overlies the outside surface of the cover but which is bendable along a first scoreline to form a loop and bendable along a second scoreline to form a backing and with the terminal portion being subsequently looped and bent at 90° to form a finished edge which overlies the binding portion of the other cover. Means are provided for clamping the finished edge snugly in place.

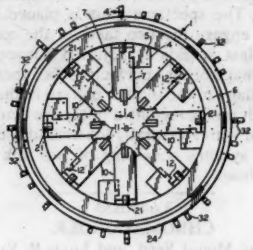
3,645,638

METHOD AND APPARATUS FOR CUTTING THREADS

Fred Theuerkauf, Naples, Fla., assignor to The Pipe Machinery Company, Wickliffe, Ohio

Filed Sept. 8, 1970, Ser. No. 70,111
Int. Cl. B23g *1/00, 5/10, 1/02, 1/22*
U.S. Cl. 408—1 14 Claims

A series of individual single tooth thread cutting tools are rotated concurrently about the axis of a pipe and are applied in cutting relation thereto in succession, at the same starting point, by movement radially of the pipe in a time delay relation to each other. They are maintained in cutting relation concurrently until they advance near to the end of the portion to be threaded. They are then retracted from the pipe in succession in the same order in which they were engaged with the pipe, in the same time delay relation to each other, all at the same location endwise of the pipe and substantially the same location circumferentially of the pipe.

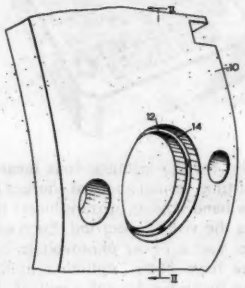


3,645,639

BORING MACHINES

John Atherton, Halifax, England, assignor to Staveley Machine Tools Limited, Halifax, England

Filed Aug. 1, 1969, Ser. No. 846,895
Int. Cl. B23b *29/03*
U.S. Cl. 408—146 10 Claims



A boring machine attachment to enable a recess of constant depth to be bored around a hole in a cylindrical wall, comprises a toolholder adapted for powered compound movement having a rotary component and an axial reciprocating component, said toolholder 50 being capable of axial movement in guides (said guides being adapted to provide said rotary component of said compound motion) and a crank device operatively connected to said toolholder to produce axial reciprocation of said toolholder in timed relationship to the mechanism which produces said rotary motion.

3,645,640

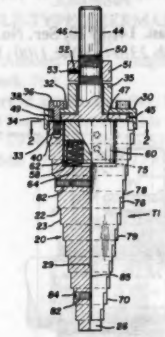
ROTARY CUTTER TOOL

Michael F. Zukas, Bayberry Road, Southhold, N.Y.

Filed June 11, 1970, Ser. No. 45,321
Int. Cl. B23b *29/034*
U.S. Cl. 408—192 11 Claims

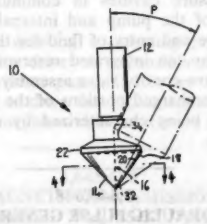
A tool assembly for boring, turning, countersinking, chamfering and facing workpiece comprising a generally cylindrical tool body with an axially extending tool slot for removably receiving a flat cutting blade. A tool driver connected to the tool body maintains rotational motion between the tool body and the workpiece. The tool body has a means for limiting depth of cut by the blade and a means for guiding the cutting blade. A blade holder in the tool body is normally

retracted by a spring means so that the blade is sheathed in the body. The blade holder may be axially advanced in the tool body by relative axial movement of the tool driver and



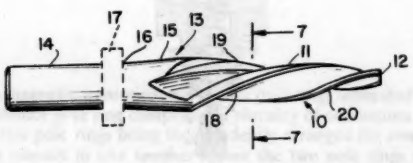
the tool body to project the cutting edge of the cutting blade, while the tool body is engaged with the workpiece for guiding the cutting blade.

3,645,641
COUNTERSINK
Jae Sun Kim, 538 Pine Avenue, Long Beach, Calif.
Filed May 4, 1970, Ser. No. 34,342
Int. Cl. B23b *51/10*
U.S. Cl. 408—199 **8 Claims**



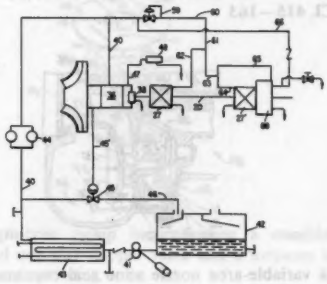
A countersink for forming an annular chamfer around a circular hole. The countersink has a conical leading end which includes a cutout having a conical portion. The apex of the conical portion is coincident with the apex of the leading end to thereby form straight cutting and trailing edges. The cutting edge has a constant cutting angle along its length and the leading end is spirally ground.

3,645,642
TAPER DRILL
George Koslow, 149 Church Street, New York, N.Y.
Filed Mar. 10, 1970, Ser. No. 18,186
Int. Cl. B23b *51/02*
U.S. Cl. 408—202 **8 Claims**



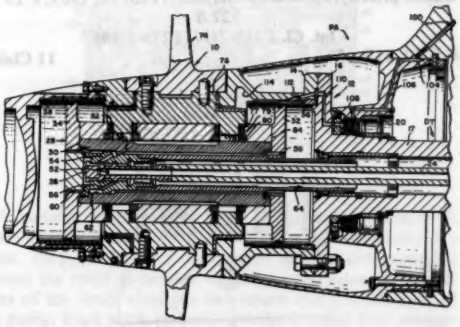
There is provided a tapered drill bit for making straight holes with portable electric drills characterized by having improved features of safety, drilling ease, speed, and utility.

3,645,643
SEAL AND LUBRICATION SYSTEM FOR ROTATING MACHINERY
Maurice B. King, III, Liverpool, and James W. Endress, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed May 11, 1970, Ser. No. 36,152
Int. Cl. F01d *11/00*
U.S. Cl. 415—111 **3 Claims**



An arrangement for preventing leakage of gas from a compressor by supplying fluid at a pressure that always exceeds the pressure of the gas by a predetermined value to a location of likely leakage wherein means are provided to assure flow of the fluid through the location over a wide variation in the pressure of the gas so that adequate cooling of the parts involved may be always obtained. Included in the arrangement is a pressure regulator valve unit constructed so that the operating parts will function despite minor misalignment such as may be encountered in assembling the parts.

3,645,644
INTERLOCKING VARIABLE-PITCH PROPELLER ASSEMBLY
Vern L. Schwisow, Marysville, Wash., assignor to Hydro Drive Corporation, Seattle, Wash.
Filed Jan. 22, 1970, Ser. No. 5,018
Int. Cl. B63h *3/08*
U.S. Cl. 416—157 **6 Claims**



Variable-pitch propeller blades are mounted for rotation about the longitudinal axis of the propeller hub and also for independent rotation about radial axes of the hub. The blades are rotated about the radial axes to change their pitch by guides slidably mounted in slots in a plurality of interlocking floating plates. A sealing system includes a stationary double-ring seal biased against the sealing surfaces of the rotatable propeller hub and a static head of fluid acting at

critical points of the propeller hub to prevent leakage of surrounding water into the propeller hub and drive assemblies.

3,645,645

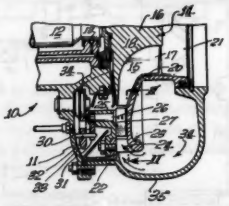
VARIABLE-AREA NOZZLE SEAL

Edward L. Gammill, Phoenix; Nick M. Hughes, and James A. Rhoden, both of Scottsdale, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 19, 1970, Ser. No. 82,023

Int. Cl. F01d *17/00*; F04d *27/00*

U.S. Cl. 415—163 **7 Claims**



This variable-area nozzle vane seal consists of a slot extending from side-to-side of a vane and from a point adjacent the leading edge to another near the overlap of the vanes when in reduced nozzle area positions. This slotting establishes in effect labyrinth seals between the sides of the vanes and the air passage in which they are disposed. The seal is further improved by drilled holes establishing communication between the slots mentioned above and the spaces between adjacent vanes. Airflow through the spaces causes reduced pressure in the slots and leakage is collected and added to flow through the nozzle to assist turbine operation.

ERRATUM

For Class 416—157 see:
Patent No. 3,645,644

3,645,646

ELECTROMAGNETIC PUMP OR CONVEYOR TROUGH

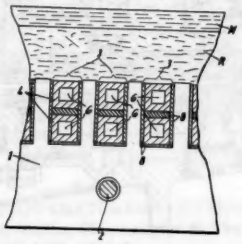
Axel Von Starck, Remscheid-Luttringhausen, Germany, assignor to AEG-Elotherm GmbH, Remscheid-Hasten, Germany

Filed Feb. 12, 1970, Ser. No. 10,793

Claims priority, application Germany, Feb. 12, 1969, P 19 06 922.8

Int. Cl. C21b *7/14*; F27b *3/18*

U.S. Cl. 417—50 **11 Claims**



An electromagnetic pump or conveyor trough for generating a traveling magnetic field by means of current carried by conductors mounted in slots in the bottom of the trough to move an electrically conductive liquid wherein a first hollow tubular conductor having its bore eccentrically offset toward the bottom of the slot and a second hollow tubular conductor with a height which does not substantially exceed the electromagnetic penetration depth are mounted atop each other in each slot with the second conductor nearest the open end of the slot.

3,645,647

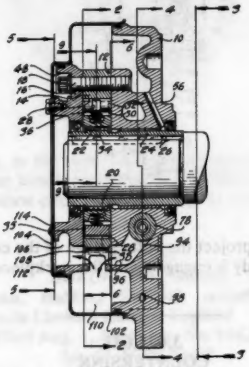
POSITIVE DISPLACEMENT FLUID PUMPS

Fred A. Ciampa, Birmingham, and Sergio J. Mazzola, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 14, 1970, Ser. No. 2,702

Int. Cl. F04b *23/04*; F04c *1/00*; F04b *49/00*

U.S. Cl. 417—79 **6 Claims**



A positive displacement fluid pump adapted especially to be used in a power steering circuit for an automotive vehicle, said pump including a pump housing in which is formed internal high-pressure cavities in communication with the discharge side of the pump and internal porting for controlling discharge and entry of fluid for the pumping chambers of the pump, an integrated reservoir surrounding the housing and a flow control valve assembly in fluid communication with supercharged portions of the pump, the overall pump assembly being characterized by reduced axial and radial dimension.

3,645,648

HYDRAULIC PULSE GENERATOR

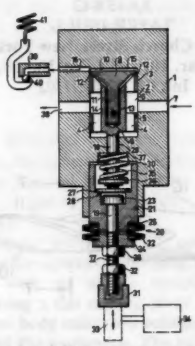
Sture Anders Backman, and Knut Ludvig Winquist, both of Orebro, Sweden, assignors to Johan H. Graffman, Benicasim, Castellon, Spain

Filed Mar. 24, 1969, Ser. No. 809,685

Claims priority, application Sweden, Aug. 23, 1968, 11,405/68; Dec. 6, 1968, 16,743/68

Int. Cl. F04b *19/00*, *21/04*, *49/00*

U.S. Cl. 417—214 **6 Claims**



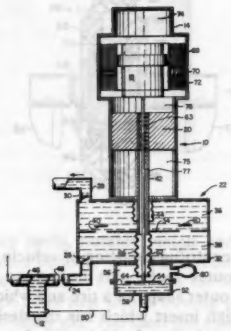
A device for creating a flow of liquid and for imparting a pulsating pressure condition thereto, such as, for example, a

device for pumping liquid fuel to the nozzle of an injection-type carburetor.

3,645,649
STIRLING CYCLE-TYPE THERMAL DEVICE SERVO PUMP

William T. Beale, Athens, Ohio, assignor to Research Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 812,530, Mar. 5, 1969, now Patent No. 3,552,120. This application Mar. 4, 1970, Ser. No. 16,519
Int. Cl. F04b *17/00*; A61f *1/00*; F25b *9/00*
U.S. Cl. 417—379 7 Claims



A servo pump assisting a pulsating primary pump. A Stirling cycle engine drives an expansible chamber pump in series with the primary pump. Pulses are transmitted from the primary pump to drive the displacer piston of the engine to drive the pump in phase with the primary pump.

3,645,650
MAGNETIC TRANSMISSION

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldinger, near Stuttgart, Germany

Filed Feb. 9, 1970, Ser. No. 9,916
Claims priority, application Austria, Feb. 10, 1969, A 1319/69
Int. Cl. F04d *25/06*; H02k *49/06*
U.S. Cl. 417—420 42 Claims

A magnetic transmission with two pole rings separated by a conductor pole ring comprising a plurality of conductors with the two pole rings being independently arranged for rotation with respect to one another where the two pole rings each have a plurality of pole faces of alternating polarity with one of the pole rings having more pole faces than the other whereby rotation of one of the pole rings with respect to the other pole ring will be at a predetermined ratio.

3,645,651
PUMP

Kenneth G. Bills, Trotwood, Ohio, assignor to TRW Inc., Cleveland, Ohio

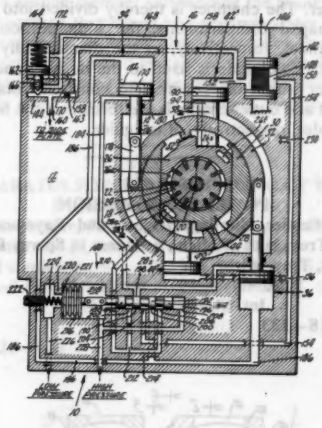
Filed Apr. 15, 1970, Ser. No. 28,652
Int. Cl. F04b *43/04*
U.S. Cl. 417—479 9 Claims

A diaphragm-type pump incorporating a combination diaphragm and one-way flapper valve and a tortuous intake passage to lessen operating noise.

3,645,652
VARIABLE DISPLACEMENT VANE PUMP

John E. Cygnor, Middletown, Conn., assignor to Chandler Evans Inc., Hartford, Conn.

Filed Apr. 14, 1970, Ser. No. 28,393
Int. Cl. F04c *15/04*
U.S. Cl. 418—31 5 Claims



A variable displacement vane pump has a plurality of vanes slidably fitted in slots formed substantially radially in a rotor. Two identical track elements are movably arranged around the rotor to provide a track for the vanes. The positions of the track elements determines the displacement of the pump. Each track element includes a radial inlet passage and a radial outlet passage. The inlet passage of one of the track elements is diametrically opposed from the inlet passage of the other of the track elements and the outlet passage of one of the track elements is diametrically opposed from the outlet passage of the other of the track elements in order to pressure balance the rotor. The track elements are slidably mounted within a frame around which is rotatably disposed a cam actuation ring. Cam members are provided on the cam ring to contact respective cam surfaces on the track elements and control the position of the track elements

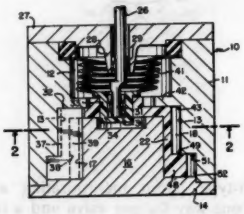
with respect to the rotor. The cam ring is rotated about the frame by means of pistons.

3,645,653

PUMP

Kurt Herbert Arnold, W. Caldwell, N.J., assignor to Valcor Engineering Corporation, Kenilworth, N.J.

Filed June 1, 1970, Ser. No. 41,852
Int. Cl. F01c *1/02*; F03c *3/00*
U.S. Cl. 418—56 14 Claims



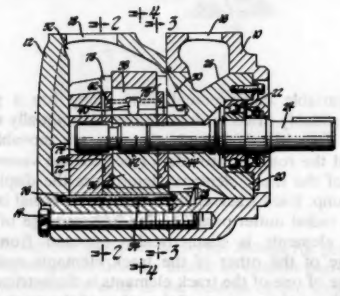
A rotary pump which includes a housing having inner and outer cylindrical surfaces defining a substantially annular internal pumping chamber. A substantially cup-shaped impeller, having inner and outer cylindrical surfaces, is movable within the chamber and is driven by an eccentric member connected to a rotary drive shaft. The position of the impeller is such that the outer housing surface and the inner impeller surface are simultaneously in substantially tangential engagement, respectively, with the outer impeller surface and the inner housing surface at diametrically opposite points of the impeller. The chamber is thereby divided into a pair of crescent-shaped compartments, the wide portion of each being proximal, respectively, to the diametrically opposite points. A flexible guide is fixed to the housing and engages the impeller within the chamber to constrain rotary movement. Inlet and outlet channels are formed in the housing on opposite sides, respectively, of the guide.

3,645,654

POWER TRANSMISSION

Albin J. Niemiec, Sterling Heights, and Raymond B. Pettibone, Troy, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed May 1, 1970, Ser. No. 33,754
Int. Cl. F01c *19/08*, *19/10*
U.S. Cl. 418—133 3 Claims



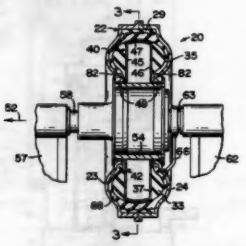
A hydraulic pump or motor unit of the rotary sliding vane type has a casing which supports a shaft and a replaceable cartridge. The cartridge has a wide cam ring and narrower vanes supported in a narrower rotor. Pressure-loaded cheek plates are contoured to fit within the cam ring and have sealed pockets on their outer face in which fluid pressure is applied to clamp the cheek plates against the rotor and vanes.

3,645,655

MOLD FOR CASTING TIRES

Heinz Wilhelm Beneze, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 14, 1969, Ser. No. 815,879
Int. Cl. B29c *5/00*; B29f *1/00*; B29h *17/00*
U.S. Cl. 425—35 4 Claims



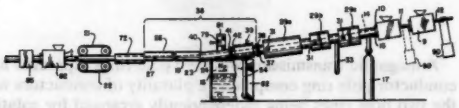
A mold for the centrifugal casting of vehicle tires comprising a separable outer mold part having an inner surface which defines the outer shape of a tire and which will hold an annular tread design insert which has the design of the tire tread on its inner surface and which may also extend around the outside surface of the to be formed tire down to the bead area. Positioned within the confines of the outer mold part is a ringlike elastic core member which has an outer surface which defines the inner surface of a tire when the elastic core member is held in extended position. The elastic core member has an inner surface which permits it to be collapsed and removed from the finished tire. A plurality of form members are located in the inner surface of the elastic core member to hold the core member in extended position. The form members are located in end-to-end relationship to each other and form a generally ringlike shape with each form comprising a sector of the ring. A cylindrical support holds the form members in position and when removed permits removal of the form members from the elastic core member in a generally radially inwardly direction. Means are provided for rotating the mold and also for introducing a flowable and curable elastomeric material into the space between the outer mold part and the elastic core member.

3,645,656

CONTINUOUSLY MANUFACTURED CABLE

John Dale Stauffer, Dekalb, Ill.; Edwin Henry Arnaudin, Jr., Marion, and Willis Lee Chrisman, Fairmount, both of Ind., assignors to Anaconda Wire and Cable Company, New York, N.Y.

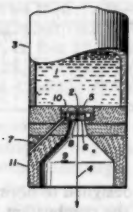
Filed May 7, 1969, Ser. No. 842,418
Int. Cl. B29h *5/00*
U.S. Cl. 425—71 14 Claims



Method and apparatus are disclosed for continuously manufacturing a cable of the type having a central conductor around which are concentrically arranged successive outer layers; electrostatic shielding insulation and jacket layers.

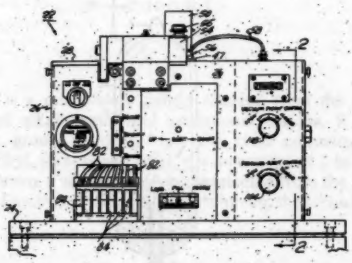
The method and apparatus includes unique means for vulcanizing the insulation layer and for subsequent cooling.

3,645,657
METHOD AND APPARATUS FOR IMPROVED EXTRUSION OF ESSENTIALLY INVISCID JETS
Roger S. Otstot, Raleigh, and John W. Mottern, Cary, both of N.C., assignors to Monsanto Company, St. Louis, Mo.
Filed July 2, 1969, Ser. No. 838,593
Int. Cl. D01d *1/00*; B22d *11/00*
U.S. Cl. 425—72 3 Claims



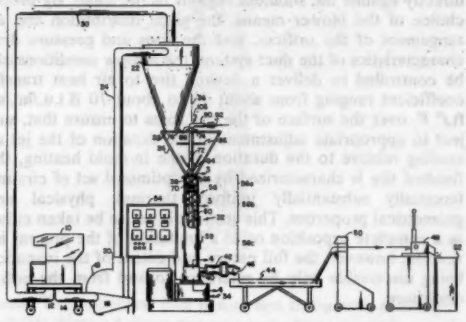
Low viscosity melts, notably metals and their alloys, are spun for extended periods, with attenuation and with induced velocity profile relaxation by spinning the molten materials at appropriate velocities first into a flowing inert gas and then into a film stabilizing gas. The inert gas zone is provided by a "gas plate" having an orifice aligned essentially coaxially with and beneath the extrusion orifice to provide an inert gas flow between the orifice plate and the gas plate.

3,645,658
FLUID POWER EJECT MECHANISM FOR A POWDER COMPACTING PRESS
Georges D. DeTroyer, Detroit, Mich., assignor to Wolverine-Pentronix, Inc., Lincoln Park, Mich.
Filed Sept. 29, 1969, Ser. No. 861,611
Int. Cl. B29c *3/00*
U.S. Cl. 425—78 13 Claims



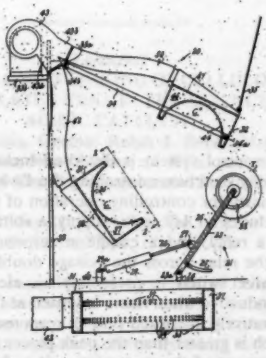
A fluid power system for a pickup and discharge mechanism for small manufactured articles or parts, such as made by a powder compacting press or the like. After compacting in a die cavity, the finished parts upon ejection from the die cavity or cavities are picked up by a pickup head operatively connected to a suction source for displacement of the finished parts over a discharge port or ports through which the finished parts are individually discharged by means of a gentle blast of pressurized air. The suction force to pick up the finished parts is obtained from a flow of air through an appropriate venturilike aspirator assembly.

3,645,659
EXTRUDING PLASTIC
Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.
Filed Mar. 13, 1969, Ser. No. 806,861
Int. Cl. B29f *3/02*
U.S. Cl. 425—204 5 Claims



An extruder is shown having: cooled screw in the feeder section; rotation retarding means in the barrel of the feeder section in the form of open mouth axial grooves; the vertical arrangement of the extruder with the hopper immersing the cooled portion of the screw with inlet plastic such as flakes of scrap; an extension of the screw into the hopper agitating the flakes and housing water inlet to the feeder; a drive shank at the outlet end isolated by an internal air chamber from the heated extruder; the shank cooled by an inserted cooling member; a sealing member surrounding the shank defining a restricted passage that tapers and accommodates eccentricity; the stationary walls of the surrounding member are grooved, resisting outward leakage of the plastic. These various features are shown to enable feeding of difficult materials and scrap and to achieve a compact, simple, efficient machine.

3,645,660
APPARATUS FOR JET AIR COOLING OF TIRES DURING POSTINFLATION
Richard H. Hugger, Ridgewood, and George C. Huang, Kinnelon, both of N.J., assignors to Uniroyal, Inc.
Original application Nov. 22, 1966, Ser. No. 596,114, now abandoned. Divided and this application May 21, 1969, Ser. No. 851,112
Int. Cl. B29h *5/02*
U.S. Cl. 425—445 17 Claims



Various forms of apparatus for cooling pneumatic tires as they are removed from the press following the mold cycle

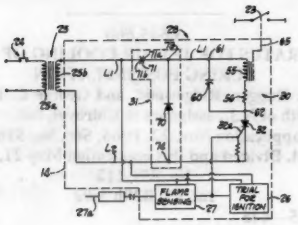
and are subjected to a postinflation cycle outside the press, are disclosed. The basic apparatus includes means defining a cooling zone in which each tire being cooled may be axially received. The cooling zone is provided with orifice means arranged coextensively with its peripheral boundary to enable cooling air to be directed in jet form against the tire in its shoulder regions simultaneously along the entire circumference thereof, preferably so as to be incident initially directly against the shoulder regions of the tread. By proper choice of the blower means, the sizes, distribution and arrangement of the orifices, and the sizes and pressure drop characteristics of the duct system, the airflow conditions can be controlled to deliver a desired tire to air heat transfer coefficient ranging from about 15 to about 70 B.t.u./hr./sq. ft./° F. over the surface of the tire so as to ensure that, subject to appropriate adjustment of the duration of the jet air cooling relative to the duration of the in-mold heating, the finished tire is characterized by an optimized set of circumferentially substantially uniform thermal, physical and geometrical properties. This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,645,661

BURNER CONTROL SYSTEM

Kenneth C. Goodman, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Aug. 6, 1969, Ser. No. 848,062
Int. Cl. F23n *5/00*
U.S. Cl. 431—24 **12 Claims**



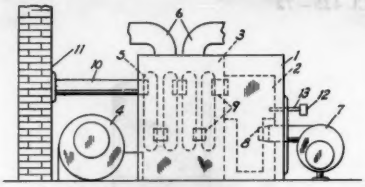
A burner control system is disclosed including a burner and fuel supply structure controlling the flow of fuel to the burner. Circuitry for controlling operation of the fuel supply structure includes an AC power supply, a voltage doubler arrangement, a relay, and a condition responsive switch for connecting the relay across the voltage doubler. The condition responsive switch is preferably an electronic switch rendered conductive when flame is sensed at the burner. The relay is operatively energized only in response to an applied voltage which is greater than the peak power supply voltage. If any component of the control circuitry short circuits, or otherwise fails, the relay cannot be operatively energized thus preventing the supply of fuel to the burner.

3,645,662

SAFETY SWITCH AND CIRCUIT FOR OIL-BURNING FURNACE

Gordon McLarty, P. O. Box 55, Augusta, Mich.

Filed Feb. 25, 1970, Ser. No. 14,081
Int. Cl. F23n *5/02*
U.S. Cl. 431—78 **8 Claims**



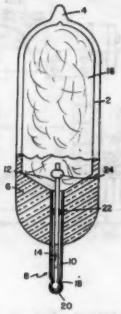
Oil-burning furnace designed to normally operate as subatmospheric pressure in the combustion chamber has an open tube opening from the combustion chamber to the exterior of the furnace adjacent the burner. A normally closed heat-responsive fuse or switch is mounted adjacent the outer end of the tube, to be responsive to abnormal backflow of hot combustion gases from the furnace. The fuse or switch is connected in controlling relation to the power circuit of the burner, to shut off the burner if abnormal back pressure develops in the combustion chamber. The switch and tube are adjustable to vary the degree of sensitivity of system to back pressure.

3,645,663

PHOTOFLASH LAMP AND METHOD OF PREPARING AND APPLYING FULMINATING MATERIAL

John W. Shaffer, Williamsport, Pa., assignor to Sylvania Electric Products, Inc.

Filed Dec. 2, 1970, Ser. No. 94,317
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 **12 Claims**



A percussive-type photoflash lamp, the primer of which comprises a wire anvil partially coated with fulminating material and coaxially supported within a tube in a manner providing a clearance between the coating of fulminating material and the inner wall of the tube. The fulminating material includes a red phosphorus fuel, a chlorate salt ox-

idizer, a powder combustible, incandescible metal, and a powdered carbon additive for facilitating propulsion of the powdered metal from the primer tube into the lamp envelope when ignited. The fulminating material is prepared and applied in the following manner: the red phosphorus, powdered metal and powdered carbon area dispersed in water to provide an aqueous slurry; the anvil wire is dipped into this aqueous slurry; the coating is dried; a dissolved chlorate salt solution is prepared; and the coated wire is dipped into the chlorate solution so as to permeate the previously applied coating.

3,645,664

HEATING APPARATUS FOR VAPORIZING PROPANE FUEL AND THE LIKE

John Rodney Clinton, P. O. Box 27, Leaburg, Oreg.

Filed May 28, 1970, Ser. No. 41,206
Int. Cl. F23d *11/44*
U.S. Cl. 431—209 **8 Claims**

Heating apparatus for vaporizing fuel is disclosed including a plenum of sleevelike shape having a jacket spaced from the outer sleeve wall. A burner discharges a flame through the sleeve with diverting means at the opposite end of the plenum to redirect the flame generated heat in an opposite direction for complete heating of the fuel in the sleevelike plenum. The vaporized fuel is supplied to burners as shown adjustably disposed above the crop to be flame treated.

CHEMICAL

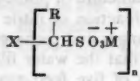
3,645,665

DYEING CELLULOSIC TEXTILES WITH VAT AND SULFUR DYES USING SODIUM DITHIONITE AND AN ALDEHYDE-BISULFITE ADDITION PRODUCT STABILIZER

James N. Etters, Danville, Va., assignor to Dan River Inc., Danville, Va.

Filed May 26, 1969, Ser. No. 827,894
Int. Cl. D06p *1/22, 1/30*
U.S. Cl. 8—34 **4 Claims**

An improved process for dyeing cellulosic textiles with vat or sulfur dyes using sodium dithionite as reducing agent, using as a stabilizer for the reducing agent a stabilizer of the formula



wherein M is a monovalent cation selected from the class consisting of alkali metal and ammonium cations, R is a monovalent group selected from the class consisting of hydrogen, alkyl, alkenyl and furyl, *n* is an integer of 1 to 3, X is a group having a valence of *n* and is selected from the class consisting of hydroxyl and substituents having the formula

and R′ is a monovalent radical selected from the class consisting of hydrogen and monovalent hydrocarbon, said stabilizer being used in an amount providing about 0.01 to about 2 mols of

unit of said stabilizer per mol of said reducing agent. Also, the stabilizer as defined above in dry particulate form and novel mixtures of reducing agent and stabilizer.

3,645,666

METHOD FOR UNIFORMING THE COLOR OF WOOD AND WOOD ARTICLES

Carroll F. Bailey, and W. Richard Oetgen, both of Orangeburg, S.C., assignors to U.S. Plywood Champion Papers Inc., New York, N.Y.

Filed Dec. 11, 1969, Ser. No. 889,860
Int. Cl. D06l *3/02*
U.S. Cl. 8—111 **12 Claims**

A method for uniformly bleaching the color of wood substrates which is characterized by preheating the substrates to a temperature of between about 140° and 200° F. applying a bleaching solution of hydrogen peroxide with, or without, an alkali metal silicate to at least the surfaces of the substrates, exposing the covered surfaces to vapors of anhydrous ammonia and drying. The apparatus for carrying out the method has a conveyor arranged for presenting the substrates or finished articles to a preheating station, preheating means such as a quartz tube or a convection oven, bleach-applying means, ammonia applying means and finally drying means.

With this invention, after drying of the wood panel or assembled article, the surface thereof is free of residues which usually are left after other bleaching methods. No washing or neutralizing step is necessary with the claimed method.

3,645,667

NONAQUEOUS CROSS LINKING OF CELLULOSE WITH A METHYLOLATED UREA IN THE ABSENCE OF AN ACIDIC CATALYST

Elwood J. Gonzales, Gretna; Ralph J. Berni, Metairie, and Ruth R. Benerito, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed May 22, 1970, Ser. No. 39,922
Int. Cl. D06m *13/14, 13/16, 13/38*
U.S. Cl. 8—116.3 **5 Claims**

This invention comprises the treatment of cellulosic textiles in the absence of an acidic catalyst with dimethylolethyleneurea (DMEU) dissolved in nonaqueous or predominantly nonaqueous solvent systems, such as neat dimethylformamide, neat dimethylacetamide, 90 percent (vol.) ethanol in water, 90 percent (vol.) dioxane in water, 90 percent (vol.) tetrahydrofuran in water, and 50 percent

(vol.) dimethylformamide in dioxane. The cellulosic products thus modified have high dry and wet wrinkle recovery when compared to cellulosic textiles treated with DMEU dissolved in water only.

3,645,668

METHOD OF MANUFACTURING SMOOTH-SURFACE SHEET MATERIALS

Kazuo Nagoshi, and Hiroshi Hayanami, both of Kurashiki, Japan, assignors to Kuraray Co. Ltd., Kurashiki, Japan

Continuation-in-part of application Ser. No. 563,999, July 11, 1966, now abandoned. This application Sept. 29, 1969, Ser. No. 862,088

Int. Cl. D06m

U.S. Cl. 8—130.1 1 Claim

Smooth-surface sheet materials are produced by forming a napless, nonwoven fibrous sheet by applying to the nap on the surface of a needle punched nonwoven fibrous sheet consisting essentially of synthetic fiber either a solvent or swelling agent for at least a part of the material constituting the nap, and subjecting the sheet to pressing, thereby laying and bonding the nap over the surface of the sheet, and impregnating the fibrous sheet with a polyurethane elastomer and covering the surface of the fibrous sheet with a layer of polyurethane elastomer.

3,645,669

METHOD AND ARRANGEMENT FOR TESTING THE LIQUID IN WASHING MACHINES

Gerhard Rausch, Obere Waldstr, 14, Meersburg, Bordensee, Germany

Continuation-in-part of application Ser. No. 322,220, Nov. 7, 1963, now abandoned. This application Feb. 28, 1969, Ser. No. 813,381

Int. Cl. B08b *3/00*

U.S. Cl. 8—137 4 Claims

In a washing machine, a galvanic element in the form of a pair of electrodes of different metals is mounted within the container for the washing liquid which acts as an electrolyte. The electrodes continuously sense the degree of dissociation of the washing liquid during the washing process with additional detergent or washing agent being added in response to the degree of dissociation. The washing liquid will contain the dirt released from the laundry being washed, the fresh water initially added at the beginning of the washing process and the washing agent or detergent.

3,645,670

PROCESSES FOR SCOURING TEXTILES

Xavier Kowalski, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 3, 1970, Ser. No. 16,244

Int. Cl. D01c *1/00*

U.S. Cl. 8—139 4 Claims

Textile fibers which have been desized and are about to be bleached are scoured with an alkaline caustic solution containing a surfactant and a synergistic inhibiting agent such as a mixture of amino tri(methylene phosphonic acid) and triethanolamine. This process provides fibers with a substantially reduced impurity level and an end product which is substantially more conducive to subsequent bleaching and dyeing processes.

3,645,671

FLUE GAS DESULFURIZATION WITH AMMONIUM SULFITE

Lindsay I. Griffin, Jr., Summit, and Albert B. Welty, Jr., Westfield, both of N.J., assignors to Esso Research and Engineering Company

Filed Oct. 24, 1969, Ser. No. 869,226

Int. Cl. C01b *17/60*; C01c *1/22*

U.S. Cl. 23—2 SQ 8 Claims

Flue gas is desulfurized by absorption in aqueous ammonium sulfite in a multiple-stage countercurrent absorber. The absorber effluent solution is regenerated by acidifying a portion thereof with ammonium bisulfate to liberate sulfur dioxide decomposing the resulting ammonium sulfate at high temperature by direct contact with hot combustion gases, and by reacting the ammonia thus formed with a second portion of the absorber effluent solution to prepare fresh ammonium sulfite absorbent solution. Regeneration is carried out at constant rate regardless of variations in the flow rates of flue gas and absorbent solution in the absorber; this is accomplished by use of surge tanks for storage of both absorbent and absorber effluent solutions.

3,645,672

MANUFACTURE OF COMPOSITE FERRITES

Frederick C. Cowlard, and George Ord, both of Ilford, England, assignors to The Plessy Company Limited, Ilford, England

Continuation of application Ser. No. 719,878, Apr. 9, 1968, now abandoned. This application Nov. 12, 1970, Ser. No. 89,013

Int. Cl. C01g *49/00*; C04b *35/26*

U.S. Cl. 23—51 3 Claims

Ferrite powder of consistent good quality and homogeneity is obtained by using nitric acid to form solutions of the nitrate of each of the metals involved, mixing the solutions in the requisite proportions, and decomposing the mixture by deposition on a hot surface while avoiding any accumulation of liquid, and then calcining the obtained oxide mixture to obtain ferrite powder with a desired proportion of ready-formed ferrite. The nitrous gases formed during solution and decomposition are used for the reconstitution of nitric acid, the tail gas of the reconstitution system being preferably contacted with an aqueous suspension of a basic oxide of a constituent metal of the ferrite, thereby forming the nitrate solution of the constituent metal.

3,645,673

PROCESS FOR THE PRODUCTION OF POTASSIUM NITRATE BY THE ION EXCHANGE METHOD

Mario Labriola, Milan, Italy, and Sandor Vajna, Bad Honnef, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 1, 1969, Ser. No. 881,272

Int. Cl. C01d *9/04*

U.S. Cl. 23—102 A 10 Claims

Process for the manufacture of potassium nitrate in the ion exchange method by reaction of nitric acid with potassium ions of a cation exchanger and recharging of the exchanger bed, characterized in that the water filled exchanger bed is supplied with a series of five feed groups, the third group being composed of the nitric acid process feed, the fifth group being composed of pure water, and wherein from the exchanger bed there is won a series of five withdrawn groups, the third withdrawn group comprising the potassium nitrate product of the ion exchange, the second, fourth, and fifth withdrawn groups being reused as, respectively, said first, second, and fourth feed groups.

3,645,674

PROCESS FOR THE MANUFACTURE OF AMMONIUM POLYPHOSPHATE

Gero Heymer, Knapsack near Cologne, and Heinz Harnisch, Lovenich near Cologne, both of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack bei Cologne, Germany

Filed May 5, 1969, Ser. No. 821,967

Claims priority, application Germany, May 31, 1968, P 17 67 655.0

Int. Cl. C01b *25/28*; C05b *7/00*

U.S. Cl. 23—106 6 Claims

Production of chain ammonium polyphosphates of the general formula $(NH_4)_{n+2}P_nO_{3n+1}$ by the reaction of a polyphosphoric acid with gaseous ammonia. Ammonium polyphosphates with a chain length *n* longer than that of the

feed polyphosphoric acid are produced by heating a polyphosphoric acid with a P_2O_5-content higher than 76 weight percent to a temperature between 80° and 100° C.; introducing gaseous ammonia thereinto while arresting the supply of further heat; allowing the temperature in the reaction mixture to increase under the action of the heat of neutralization set free; maintaining the reaction mixture, if necessary by cooling, between 300° and 330° C. until the temperature itself commences to fall below 300° C; allowing the reaction mixture to stand at temperatures between 230° and 270° C., which are maintained, if necessary by supplying further heat, until formation of a viscous crystalline magma which practically ceases to absorb further ammonia; cooling the reaction product, washing it and drying it at temperatures lower than 100° C.

3,645,675
AMMONIUM PYROPHOSPHATES, PROCESSES FOR PREPARING, AND USES

Paul G. Sears, Lexington, Ky., and Howard L. Vandersall, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 722,499, Dec. 7, 1967, now abandoned , which is a division of application Ser. No. 514,657, Dec. 17, 1965, now abandoned , which is a continuation-in-part of application Ser. No. 301,918, Aug. 13, 1963, now abandoned. This application Dec. 19, 1969, Ser. No. 886,775

Int. Cl. C01b *25/28*

U.S. Cl. 23—106 **6 Claims**

Ammonium pyrophosphates of the formula $(NH_4)_2\ _7H_1\ _3P_2O_7$ and $(NH_4)_3\ _3H_7P_2O_7$ are useful as intermediates in the preparation of polymeric water insoluble ammonium polyphosphates and as final products in detergent and fertilizer applications. The new ammonium pyrophosphates are prepared by condensing orthophosphoric acid with a combined ammoniating and condensing agent, e.g., urea, in a molar ratio of nitrogen to phosphorus of 1.4 to 1.75 or 2.5 to 4.0.

3,645,676
PRODUCTION OF MONOCALCIUM ORTHOPHOSPHATE

Linden Wayne Cochran, Basking Ridge, N.J., assignor to Multi-Minerals Limited, Toronto, Ontario, Canada

Filed Mar. 4, 1969, Ser. No. 804,276. The portion of the term of the patent subsequent to Feb. 10, 1987, has been disclaimed.

Int. Cl. C01b *25/22, 25/32*

U.S. Cl. 23—109 **4 Claims**

A multicycle process for the continuous production of high-purity monocalcium orthophosphate which may, if desired, be used as a fertilizer material. The monocalcium orthophosphate is produced by the digestion of phosphate raw material with phosphoric acid to form a solution containing monocalcium orthophosphate which is then crystallized and recovered from solution. A portion of the recovered salt is removed as the end product. The remaining portion is contacted with a cationic exchange resin on the hydrogen cycle to produce phosphoric acid which is recycled for use in the digestion of more phosphate raw material.

3,645,677
PRODUCTION OF GYPSUM

Hakuichi Akazawa; Shigeaki Washio, both of Kakogawa; Keiji Kaji, Akashi, and Shisao Fujita, Kakogawa, all of Japan, assignors to Taki Fertilizer Manufacturing Co., Ltd., Kakogawa, Japan

Filed Sept. 24, 1969, Ser. No. 860,770

Claims priority, application Japan, Sept. 24, 1968, 43/68292

Int. Cl. C01b *25/22;* **C01f** *11/46*

U.S. Cl. 23—122 **8 Claims**

Production of calcium sulfate dihydrate (gypsum) by hydrating calcium sulfate hemihydrate in admixture with a surface active agent, sulfuric acid and phosphoric acid, the mole ratio H_2SO_4/H_3PO_4 being greater than 0.4.

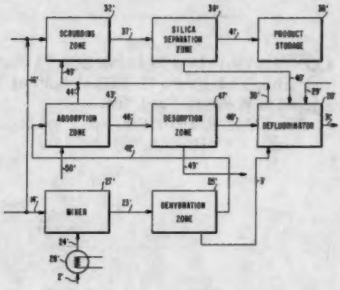
3,645,678
CONCENTRATING FLUOSILICIC ACID

William R. Parish, and James C. Kelley, both of Lakeland, Fla., assignors to Wellman-Lord, Inc.

Filed Mar. 9, 1970, Ser. No. 17,580

Int. Cl. C01b *7/22, 33/08, 33/00*

U.S. Cl. 23—153 **21 Claims**



A process for the concentration of aqueous fluosilicic acid solutions is disclosed. In the process, a dilute aqueous fluosilicic acid solution is premixed with concentrated sulfuric acid under superatmospheric pressure and elevated temperatures; the mixture is introduced to a reduced pressure, high-temperature dehydration zone to release a gaseous overhead containing essentially all of the silicon tetrafluoride and a liquid sulfuric acid bottoms; the gaseous overhead is passed to a scrubbing zone to effect reaction of the silicon tetrafluoride with the water content of a dilute aqueous fluosilicic acid solution and thereby concentrate the fluosilicic acid content therein and the concentrated fluosilicic acid solution is then recovered. Advantageously, the diluted sulfuric acid bottoms can be contacted with a siliceous material to convert any contained hydrogen fluoride to another silicon tetrafluoride-containing gaseous overhead which is also passed to the scrubbing zone to effect further concentration. Hydrogen fluoride may also be recovered in pure form in a particular embodiment.

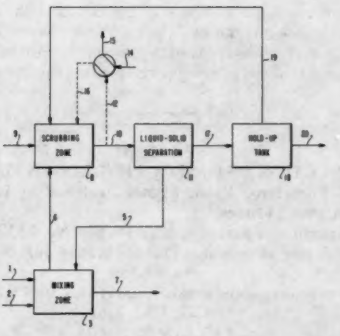
3,645,679
CONCENTRATING FLUOSILICIC ACID

William R. Parish, and James C. Kelley, both of Lakeland, Fla., assignors to Wellman-Lord, Inc.

Filed Mar. 9, 1970, Ser. No. 17,590

Int. Cl. C01b *7/00, 33/12, 33/08*

U.S. Cl. 23—153 **10 Claims**



A process for the concentration of aqueous fluosilicic acid solution is disclosed. In the process, a dilute aqueous fluosilicic acid solution is mixed with concentrated sulfuric acid in the presence of silica in a mixing zone to release a gaseous

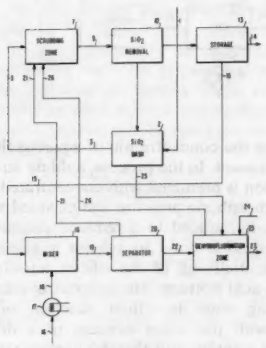
overhead of silicon tetrafluoride (formed by dehydration of the fluosilicic acid) and yield dilute sulfuric acid as bottoms; the gaseous overhead is passed to a scrubbing zone to effect reaction of the silicon tetrafluoride with dilute fluosilicic acid, and thereby yield a slurry of silica in concentrated, aqueous, fluosilicic acid solution. The silica and the concentrated acid are separated, and the silica can be sent to the mixing zone.

3,645,680

CONCENTRATING FLUOSILICIC ACID

William R. Parish, and James C. Kelley, both of Lakeland, Fla., assignors to Wellman-Lord, Inc.

Filed Mar. 9, 1970, Ser. No. 17,611
Int. Cl. C01b *7/00, 33/12, 33/08*
U.S. Cl. 23—153 **15 Claims**



A process for the concentration of aqueous fluosilicic acid solutions is disclosed. In the process, a concentrated aqueous fluosilicic acid solution is premixed with concentrated sulfuric acid under superatmospheric pressure and elevated temperatures; the mixture is introduced to a reduced pressure, high-temperature dehydration zone to release a gaseous overhead containing essentially all of the silicon tetrafluoride formed by the dehydration of the fluosilicic acid and a liquid sulfuric acid bottoms containing essentially all of the hydrogen fluoride thereby produced; the gaseous overhead is passed to an aqueous scrubbing zone to effect reaction of the silicon tetrafluoride with the water content of a dilute, aqueous fluosilicic acid scrubbing solution and thereby yield a concentrated, aqueous fluosilicic acid solution. The concentrated fluosilicic acid solution is recovered and part is recycled for use as the fluosilicic acid solution which is mixed with the concentrated sulfuric acid. Advantageously, the dilute sulfuric acid bottoms is contacted with a siliceous material to convert the hydrogen fluoride therein to another silicon tetrafluoride-containing gaseous overhead which is also passed to the scrubbing zone to effect further concentration.

3,645,681

PRODUCTION OF GASEOUS HYDROGEN FLUORIDE

Roland Bachelard, Lyon, France, assignor to Ugine Ruhlmann, Paris, France

Continuation-in-part of application Ser. No. 737,327, June 17, 1968, now abandoned. This application July 8, 1970, Ser. No. 53,300
Claims priority, application France, May 30, 1967, 108352, Oct. 27, 1967, 126140
Int. Cl. C01b *7/22, 9/08, 1/16*
U.S. Cl. 23—153 **11 Claims**

A process for preparing substantially pure gaseous hydrogen fluoride from ammonium bifluoride by reacting a product containing ammonium bifluoride with a metal fluoride or a double fluoride of ammonium and metal at a temperature up to 500° C. to produce substantially pure gaseous hydrogen fluoride and a fluometallate. The fluometallate can thereafter be decomposed into gaseous ammonium fluoride and the metal fluoride or double fluoride of ammonium and metal. The process is conducted under anhydrous medium reaction conditions, and the starting materials are solid prior to being heated.

3,645,682

PROCESS FOR PRODUCING PHOSPHORIC ACID BY THE USE OF ION EXCHANGE RESINS

Linden Wayne Cocaran, Basking Ridge, N.J., assignor to Multi-Minerals Limited, Toronto, Ontario, Canada

Filed Sept. 13, 1967, Ser. No. 667,568
Int. Cl. C01b *25/18*
U.S. Cl. 23—165 **11 Claims**

The invention relates to an improved method of ion exchange. The inventive concept involves directly contacting a substantially dry ion exchange resin with a substantially dry material which material is solubilized by the resin. The inventive principle is applicable to cationic or anionic resins and is adaptable to fixed bed, semimoving bed or continuous ion exchange systems. New results and advantages include significantly improved quality and yield of ion exchange product. The invention is particularly applicable to the production of phosphoric acid produced by reacting monocalcium orthophosphate with a strong acid ion exchange resin on the hydrogen cycle.

3,645,683

REGENERATION OF ACID

Charles Levi Isbell, Jr., Charleston, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 724,303, Feb. 6, 1968, now Patent No. 3,549,320, which is a division of application Ser. No. 349,536, Mar. 3, 1964, now Patent No. 3,419,601.
This application Mar. 10, 1970, Ser. No. 18,323. The portion of the term of this patent subsequent to Dec. 22, 1987, has been disclaimed.
Int. Cl. C01b *17/50*
U.S. Cl. 23—177 **10 Claims**

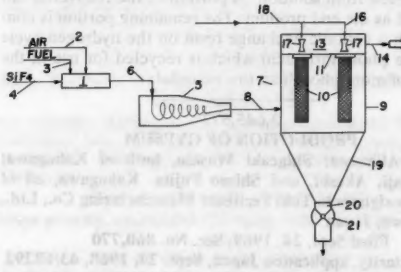
Production for sulfur dioxide containing gas by spraying a waste liquor containing a sulfur acid and an ammonium salt into a reactor in the presence of molecular oxygen at a temperature of 850° C. to 1,150° C.

3,645,684

FRACTIONATION OF SILICA AEROSOLS

George L. De Cuir, Monroe, La., assignor to Cities Service Company, New York, N.Y.

Filed July 1, 1970, Ser. No. 51,633
Int. Cl. C01b *33/18, 33/14*
U.S. Cl. 23—182 V **10 Claims**



Pigmentary silica is produced by hydrolysis of silicon tetrafluoride in hot flame gases. The silica in the resultant aerosol is then agglomerated and the silica is thereafter filtered from the gases at a temperature above the dew point.

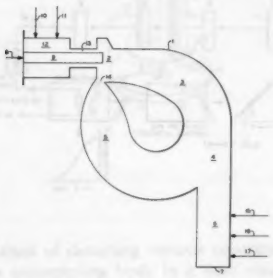
The concentration of silica in the aerosol is substantially the same at filteration as when produced, i.e., little or none of the agglomerated silica is permanently separated from the aerosol prior to filtration.

3,645,685

CARBON BLACK MANUFACTURE

Willie W. Crouch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 3, 1969, Ser. No. 873,432
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 **8 Claims**



Carbon black is produced by introducing a hydrocarbon feed and hot combustion gases into a feed introduction zone, passing the resulting mixture into a carbon black formation zone under carbon black forming conditions to produce smoke comprising carbon black, dividing said smoke into separate first and second portions, recycling said first portion of smoke under carbon black forming conditions to the feed introduction zone, and recovering carbon black from said second portion of smoke. Loop reactor apparatus for conducting the process is disclosed.

3,645,686

PRODUCTION OF ULTRAPURE SEMICONDUCTOR MATERIALS

Thomas N. Tucker, Thomas Township, Saginaw County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 4, 1970, Ser. No. 34,866
Int. Cl. C01b *33/02*
U.S. Cl. 23—223.5 **7 Claims**

A method of reducing the contamination of ultrapure materials, such as silicon, with impurities from carbon bodies used in the production of said material s which method comprises pretreating the carbon bodies with water vapor at high temperature whereby the impurities react with the water vapor and either diffuse to the surface of the carbon body and are removed or remain complexed within the carbon body.

3,645,687

IMMUNODIFFUSION PLATE APPARATUS

Samuel T. Nerenberg, 21 Haynard Court, Burlingame, Calif.

Filed Jan. 5, 1970, Ser. No. 642
Int. Cl. C12b *1/00;* **G01n** *33/16*
U.S. Cl. 23—230 R **8 Claims**

A device for the quantitative determination of protein by radial diffusion thereof through a coating of antibody on a sheet formed of a paper-thin liquid-permeable chemically inert layer (e.g., cellulose acetate) on a resilient liquid-impermeable backing (e.g., flexible plastic). The device includes a wall and marginal framework therearound, having a slot for slidably receiving a perforate or solid plate into a fixed position above the wall. The device further includes means for slidably receiving said sheet between the wall and either of the plates in position. Blood serum may be applied via a capillary tube through the openings in the perforated

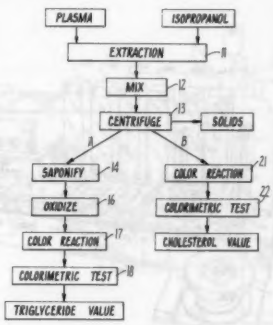
plate onto a sheet in predetermined placement. In one embodiment, the device contains identical back-to-back units as above described. In a second embodiment, one side of such back-to-back units contains parallel members mounted on one wall and cooperating therewith to form parallel slots adapted to receive a number of sheets.

3,645,688

MEASURING TRIGLYCERIDE AND CHOLESTEROL IN BLOOD PLASMA OR SERUM

Ronald B. Smernoff, Belmont, Calif., assignor to Oxford Laboratories, San Mateo, Calif.

Filed Mar. 25, 1970, Ser. No. 22,548
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **10 Claims**



Method of detecting and analyzing hyperlipoproteinemia. Interfering components of blood or plasma are extracted with an alumina mixture and values of cholesterol and triglyceride in the extract are determined, so that the type and presence of hyperlipoproteinemia may be recognized.

3,645,689

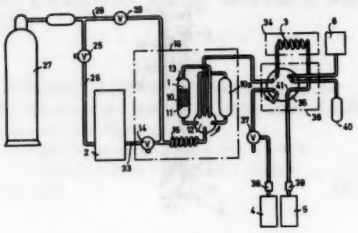
METHOD AND APPARATUS FOR ANALYZING PROTEINS

John A. Sjoquist, Uppsala, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Apr. 9, 1970, Ser. No. 26,977
Int. Cl. G01n *31/06, 31/08, 33/00*
U.S. Cl. 23—230 R **16 Claims**

A method and an apparatus for determining the sequence of the amino acids in a protein. The protein is applied to the surface of a solid support arranged in a reactor. A vaporized

coupling agent is supplied to the protein thus forming a protein derivative. The protein derivative is split at the first peptide binding by a supplied vaporized splitting agent and



the amino acid derivative split off is transferred to an absorber. By raising the temperature of the absorber the amino acid derivative is then transferred to an analyzer, e.g., a gas chromatograph.

3,645,690

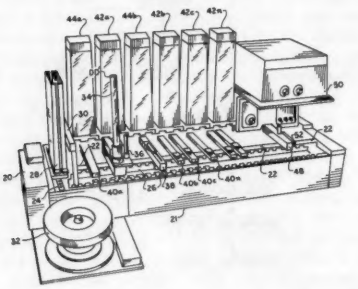
AUTOMATED CHEMICAL ANALYZER

Jerry E. Rochte, Seal Beach; Donald N. Martin, Whittier; Jack L. Hoffa, Brea, and George V. Moore, La Habra, all of Calif., assignors to Beckman Instruments, Inc.

Filed Jan. 22, 1968, Ser. No. 699,618

Int. Cl. G01n *33/16, 1/10, 1/18*

U.S. Cl. 23—230 R **39 Claims**



A system employing individual sample capsules, each of inexpensive hollow body, open bottom construction with end tabs and cups formed in the body, a pair of horizontal rails on which the capsules are conveyed side-by-side past processing stations in stop and go fashion by the up-and-down action of the rails and to-and-fro movement of a pair of racks having teeth-engaging within the capsule body and moving the capsule in one direction when the rails are down, the teeth being free of the capsule to move in the opposite direction when the rails are up, with automatic means for dropping a capsule onto the rails, transferring a sample from a container to one of the cups in the capsule, adding reagents, filtering the reacted sample, transferring fluid from one cup to another, incubating the sample, performing a colorimetric reading and removing fluid from all cups prior to discard of the capsule, the system being essentially pneumatically operated using pneumatic logic controlled by triggers associated with the various components of the system.

3,645,691

METHOD OF QUANTITATIVELY DETERMINING IODINE AND THYROID HORMONES

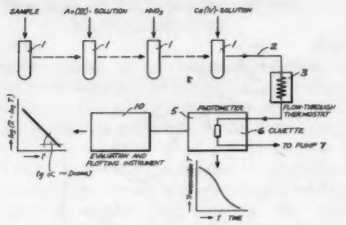
Guenter Knapp, Sorgerweg 16/8010, and Hans Spitzy, Herrengasse 3/8010, both of Graz, Austria

Filed Feb. 26, 1969, Ser. No. 802,421

Claims priority, application Austria, Feb. 27, 1968, A 1889/68

Int. Cl. G01m *21/24, 31/22, 33/16*

U.S. Cl. 23—230 R **3 Claims**



Improved method of quantitatively determining iodine or thyroid hormones according to the method of Sandell and Kolthoff by replacing sulfuric acid by nitric acid. A preferred measuring apparatus consists of a thermostat, a photometer, and an evaluating and plotting instrument.

3,645,692

PROCESS FOR THE PREPARATION, PRESERVATION AND TRANSPORTATION OF BLOOD AND SERUM SAMPLES FOR USE IN CLINICAL ANALYSES

Harald Stork, Lampertheim/Hessen, and Felix Helmut Schmidt, Mannheim-Neuostheim, both of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed June 11, 1969, Ser. No. 832,432

Claims priority, application Germany, July 15, 1968, P 17 73 841.9; Mar. 19, 1969, P 19 13 817.1

Int. Cl. G01n *31/04, 33/18*

U.S. Cl. 23—230 B **10 Claims**

Process for the preparation, preservation and transportation of blood and serum samples for use in the determination of chemical and biochemical components therein, comprising applying onto an absorbent carrier having ion exchange properties samples of serum or blood, drying the carrier and sample and eluting the same just immediately prior to carrying out the indicated determination, the determination being carried out on the eluate.

3,645,693

CHEMICAL DETECTOR

Edward J. Poziomek, Bel Air, and Eleanor V. Crabtree, Towson, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Nov. 3, 1969, Ser. No. 873,707

Int. Cl. G01n *21/12*; **G01n** *31/22*

U.S. Cl. 23—230 R **6 Claims**

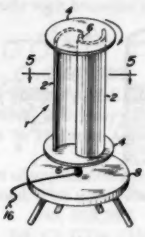
Electrophile compounds used as intermediates or pesticides can be detected by forming volatile derivatives of said compounds by treatment with N-alkylformamides producing isocyanide ions which contact an inert support medium, then treating said medium and its contents with a detector agent for said ions thus producing the color detector signal for said ions.

3,645,694

AUTOROTATING BODY GAS DETECTOR AND METHOD OF USING THE SAME

Abraham Flatau, Joppa, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 16, 1968, Ser. No. 761,390
Int. Cl. G01n 31/22
U.S. Cl. 23—232 R 9 Claims



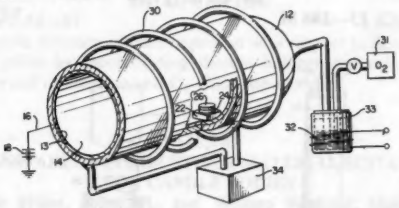
The method of detecting various constituents comprising placing an autorotating body in a fluid medium fitted with absorbent materials capable of retaining the various fluid components which are subsequently tested for presence or absence by known chemical and/or physical means.

3,645,695

FURNACE APPARATUS FOR BLOCKING SODIUM IONS

Ronald L. Koepp, Dayton, and Stanley J. Dudkowski, Kettering, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Oct. 14, 1969, Ser. No. 866,185
Int. Cl. B01j 1/00; C23c 11/00
U.S. Cl. 23—252 R 4 Claims



The present invention relates to a processing apparatus for growing and annealing a silicon dioxide insulator layer to obtain a mobile positive ion free silicon dioxide insulator layer. A mobile positive ion free silicon dioxide insulator layer is required in order to make a stable insulated gate field effect transistor. The processing apparatus comprises a nonoxidizing high-melting-point platinum metal film coated quartz furnace tube, potential means for placing a positive potential upon the platinum metal film coating of the platinum metal film coated quartz furnace tube to repel mobile ions therefrom, heater means for heating the interior of the quartz furnace tube, and gas means for passing oxygen gas through the platinum metal film coated quartz furnace tube. A silicon wafer may be oxidized in said processing apparatus to form a relatively mobile positive ion free silicon dioxide insulator layer of an insulated gate field effect transistor upon the silicon wafer. The silicon dioxide insulator layer is relatively uncontaminated by mobile positive ions which exist to the outside of the platinum metal film coated quartz furnace tube. A silicon wafer which previously has been coated by a silicon dioxide insulator layer may be processed to remove mobile ions within the silicon dioxide insulator layer. Mobile positive ions are repelled by the positive potential applied to the platinum metal film away from the outside of the quartz furnace tube, and mobile positive ions of the silicon dioxide insulator layer within the platinum metal film coated quartz tube are removed by the flowing oxygen gas due to the low-vapor pressure of the mobile positive ions.

3,645,696

METHOD FOR STABILIZING CHROMOGENIC TEST REAGENT FOR ALDEHYDE

Rudolph L. Iannacone, Cranbury, and Anthony J. Revukas, Cranford, both of N.J., assignors to Cities Service Oil Company

Filed Apr. 30, 1970, Ser. No. 33,538
Int. Cl. G01n 31/22
U.S. Cl. 23—253 TP 12 Claims

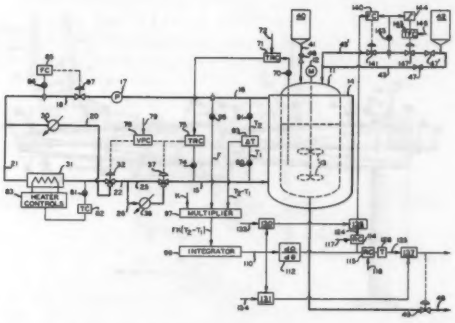
A chromogenic reagent normally unstable upon exposure to air is stabilized for use in an aldehyde detection test. The chromogenic reagent, preferably 3-methyl - 2-benzothiazolinone hydrazone hydrochloride monohydrate (MBTH), is prepared by adsorption on a suitable supporting media and drying in an inert atmosphere.

3,645,697

CONTROLLING APPARATUS OF A REACTOR

Alfred A. Hoffman, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed July 18, 1969, Ser. No. 843,158
Int. Cl. G01n 25/42
U.S. Cl. 23—253 A 5 Claims



A batch reactor is controlled by measuring heat transfer to or from the reactor and integrating the measured signal. When the integrated signal reaches a preselected value, the reaction is terminated. The integrated signal can also be used to control introduction of a reactant.

3,645,698

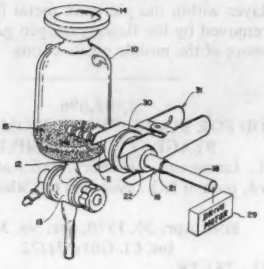
SAMPLING APPARATUS

Leslie D. Holybee, Cupertino; Henry Faigh, Sunnyvale, and Robert B. Samuels, Menlo Park, all of Calif., assignors to Beckman Instruments, Inc.

Filed Oct. 6, 1969, Ser. No. 863,873
Int. Cl. G01f 11/10
U.S. Cl. 23—253 R 9 Claims

An apparatus for monitoring the progress of a peptide synthesis process being carried out in a closed reaction vessel

including a slidable member having a plurality of pockets for trapping small aliquots of peptide-resin cooperating with the



interior of the reaction vessel for selectively removing samples of peptide-resin without exposing the interior of the reaction vessel to the surrounding environment.

3,645,699

SOLID-LIQUID CONTINUOUS COUNTERCURRENT PURIFIER METHOD AND APPARATUS

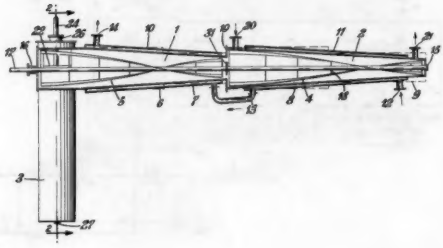
John Alfred Brodie, New South Wales, Australia, assignor to Union Carbide Australia Limited

Filed Sept. 17, 1969, Ser. No. 858,596

Claims priority, application Australia, Sept. 18, 1968, 43524/68

Int. Cl. B01d *9/04*

U.S. Cl. 23—273 F **12 Claims**



At least one component of a multicomponent molten mixture is separated from the mixture and purified by introducing the mixture into the recovery section of an array of apparatus comprising a recovery section, a refining section and a purifying section. The recovery and purifying sections each have helical scraper-conveyors to move crystals through them, increasing cross sectional areas in the direction of crystal progression and downward temperature gradients in the direction of liquid and reflux movement which is countercurrent to the crystal progression. The feed mixture is introduced to the recovery section near its junction with the refining section and flows in the countercurrent or reflux direction. Crystallization occurs at a certain temperature encountered in the recovery section and the crystals grow and are purified as they are moved by the scraper-conveyors through the recovery and refining sections and into the purifying section and purify by gravitational movement through the countercurrent molten reflux. At the end of the progression through the purifier, the crystals are remelted and withdrawn as substantially pure preselected component.

3,645,700

APPARATUS FOR FLUIDIZED-BED REACTIONS

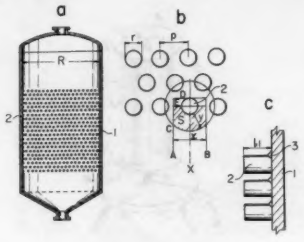
Masao Nagamura; Hiromichi Seya; Takaya Iseki, and Mikio Suzuki, all of Chiba-ken, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1970, Ser. No. 3,910

Claims priority, application Japan, Jan. 24, 1969, 44/4735

Int. Cl. B01j *9/18*

U.S. Cl. 23—284 **8 Claims**



The invention provides an improved vessel for fluidized-bed reactions, characterized by the provision of metal or nonmetal projections of various shapes at calculated intervals on the internal sidewall of the vessel. The improved vessel results in a substantially reduced wear of the internal wall of the fluidized-bed vessel without detracting from the heat-exchange efficiency between the internal wall and the exterior of the vessel.

3,645,701

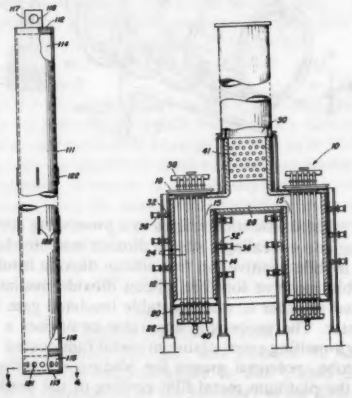
REFORMER FURNACE

Ira N. Banchik, Brooklyn; Morgan C. Sze, Garden City, L.I., both of N.Y., and Maldwin J. Maddock, Elizabeth, N.J., assignors to The Lummus Company, New York, N.Y.

Original application June 19, 1967, Ser. No. 647,021, now Patent No. 3,527,565, dated Sept. 8, 1970. Divided and this application Feb. 2, 1970, Ser. No. 12,497

Int. Cl. B01j *9/04*

U.S. Cl. 23—288 M **7 Claims**



Reformer furnace having a plurality of tubes in the radiant section thereof, the lower portion of the tubes having a reformer catalyst and the upper portion being free of catalyst. A plug is positioned in the upper portion to provide a restricted flow passage for a steam-hydrocarbon mixture introduced into the tubes and the plug includes means for evenly distributing the mixture from the restricted flow passage over the catalyst.

3,645,702

DIFLUOROBROMINIUM TETRAFLUOROBORATE

Madeline S. Toy, Fountain Valley, and William A. Cannon, Costa Mesa, both of Calif., assignors to The United States of America as represented by the Secretary of the Army

Filed July 19, 1968, Ser. No. 745,984
Int. Cl. C01b *35/00, 7/24;* C06d *5/00*
U.S. Cl. 23—367 2 Claims

The novel compound difluorobrominium tetrafluoroborate and method of preparation thereof consisting of the contacting of boron trifluoride with bromine trifluoride.

3,645,703

HELIUM PERMEABLE CONTAINERS

Louis Frank, Baltimore, and Harry P. Kling, Glenarm, both of Md., assignors to Hittman Associates, Inc., Baltimore, Md.

Continuation-in-part of application Ser. No. 454,542, May 10, 1965, now abandoned. This application July 28, 1966, Ser. No. 568,597
Int. Cl. G21c *13/00*
U.S. Cl. 29—182.5 16 Claims

An alpha-emitting radioisotope source container which allows for the controlled release of helium gas without permitting any radioactive material to escape, the container being a metal-fiber composite of helium impermeable metallic wall means with helium permeable quartz fibers reinforcing the wall means and extending continuously through at least a portion of said wall means and providing a fibrous helim leak path.

3,645,704

MIDDLE DISTILLATE POUR DEPRESSANT

Herbert G. Burkard, Convent Station; Harold N. Miller, Millington, and Edward N. Kresge, Elizabeth, all of N.J., assignors to Esso Research and Engineering Company

Continuation of application Ser. No. 637,334, May 10, 1967, now abandoned. This application Aug. 19, 1969, Ser. No. 854,021
Int. Cl. C10l *1/20*
U.S. Cl. 44—62 12 Claims

Middle distillate oils are improved with respect to flow and pour point by incorporating therein halogenated polymers comprised of ethylene and C_3–C_{18} alpha-olefins.

3,645,705

TRANSPARENT COMBUSTIBLE MATERIAL SUITABLE FOR CANDLE BODIES

Aaron Miller, Niles, Ill., and William Siegfried, Oshkosh, Wis., assignors to Kolar Laboratories, Inc., Chicago, Ill.

Filed Mar. 3, 1970, Ser. No. 16,222
Int. Cl. C10l *5/00*
U.S. Cl. 44—7.5 6 Claims

A transparent combustible candle body material formed by combining a straight chain aliphatic amide with light mineral oil and adding alcohol thereto.

3,645,706

RESINOID GRINDING WHEELS CONTAINING NICKEL-COATED CUBIC BORON NITRIDE PARTICLES

Harold Paul Bovenkerk, Worthington, and William Arthur Berecki, Columbus, both of Ohio, assignors to General Electric Company

Filed Dec. 16, 1969, Ser. No. 885,630
Int. Cl. B24d *17/00*
U.S. Cl. 51—295 6 Claims

An improved resinoid grinding wheel particularly useful for the wet or dry grinding of hardened steels and steel alloys utilizes nickel-coated cubic boron nitride particles as the abrasive medium.

3,645,707

GLASS FIBER COATING METHOD

Thomas E. Philipps, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Feb. 9, 1970, Ser. No. 10,054
Int. Cl. C03c *25/02*
U.S. Cl. 65—3 8 Claims

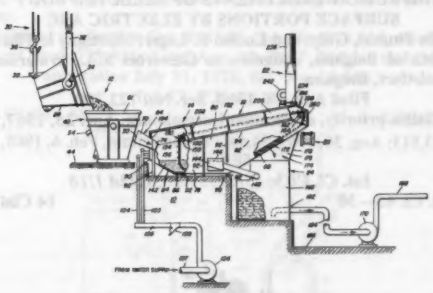
A method of using a composition in the treatment of glass fibers to provide easier filamentizing of fiber strands, said composition is especially adapted for use on glass fibers which are to be used in the production of glass fiber mats when maximum water-repellent properties are desired. In a preferred embodiment the composition consists of phenyltrimethoxy silane in a suitable solvent.

3,645,708

STEEL SLAG HANDLING SYSTEM AND METHOD FOR USING

John J. Grady, deceased, late of New Florence, Pa. (by Betty Jane Grady, executrix), assignor to International Steel Slag Corporation, Washington, D.C.

Continuation of application Ser. No. 632,704, Apr. 21, 1967, now abandoned, and a continuation-in-part of Ser. No. 632,822, Apr. 21, 1967, now Patent No. 3,523,015, and 632,704, and 632,822, Continuation-in-part of application Ser. No. 428,519, Jan. 27, 1965, now Patent No. 3,316,075, and a continuation-in-part of 535,143, Mar. 17, 1966, now abandoned , and 428,519, , and 535,143, , Continuation-in-part of application Ser. No. 126,792, June 21, 1961, now abandoned. This application Dec. 4, 1969, Ser. No. 882,317. The portion of the term of this patent subsequent to Apr. 25, 1984, has been disclaimed.
Int. Cl. C03b *5/18*
U.S. Cl. 65—19 27 Claims



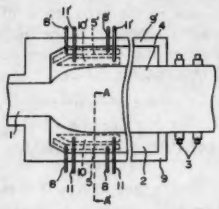
A system is described for improved processing and disposal of molten steel slag formed during steel furnace operation. The system comprises steel slag granulator apparatus of the type described in detail in copending U.S. Pat. application Ser. No. 428,519 and associated equipment including controllable molten slag feeding apparatus, aspirator-pump means for collecting the steam generated during the slag granulation process, and for transferring it to a suitable disposal point, an improved water nozzle arrangement to produce a U-shaped or H-shaped jetstream of water for slag granulation, and a hydraulic transport apparatus for conveying the granulated and cooled steel slag away from the granulator in the form of a water-slag slurry. The system also includes slag dewatering apparatus to extract the granulated slag particles from the slurry to permit storage or disposal in relatively dry form, and high-efficiency filtering means to permit direct disposal of the granulating water in nearby rivers or sewers without danger of contamination due to high solids concentration in the discharged water. One embodiment includes means for stockpiling the dried slag directly on the ground, while a second embodiment includes means for classifying the slag particles by size prior to storage.

3,645,709

PROCESS FOR MANUFACTURE OF FLAT GLASS ON A MOLTEN METAL BATH

Yukiya Fujimoto, and Isao Kurashina, both of Kyoto, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Mar. 9, 1970, Ser. No. 17,639
Claims priority, application Japan, Mar. 12, 1969, 44/19137; Apr. 22, 1969, 44/31849
Int. Cl. C03b *18/02*
U.S. Cl. 65—27 10 Claims



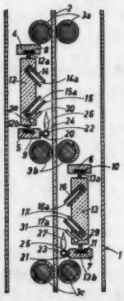
In a process for the manufacture of flat glass which comprises flowing molten glass onto a molten metal bath and advancing the molten glass on the bath in ribbon form, the improvement residing in that the molten metal is contacted with a refractory of acidic or neutral oxide or low alkali or nonalkali glass which is replaceably immersed in the molten metal bath, and that the refractory or low alkali or nonalkali glass on which the reaction product thereof with the alkali metal oxide in the molten metal is formed is withdrawn from the bath to be replaced by new refractory or glass at regular intervals.

3,645,710

DIFFUSION TREATMENTS OF SELECTED BODY SURFACE PORTIONS BY ELECTRIC ARC

Emile Plumat, Gilly, and Lucien F. Leger, Montigny le Tilleul, both of Belgium, assignors to Glaverbel S.A., Watermael Boistfort, Belgium

Filed Apr. 18, 1968, Ser. No. 722,390
Claims priority, application Luxembourg, Apr. 25, 1967, 53.513; Aug. 30, 1967, 54,401; Great Britain, Feb. 6, 1968, 5839/68
Int. Cl. C03c *15/00, 29/00;* C22d *1/18*
U.S. Cl. 65—30 14 Claims



Method and apparatus for the controlled diffusion of ions from a gaseous medium into selected surface portions of a body by contacting such portions with a gaseous diffusion substance at least one element of which represents a source of the ions which are diffused into the material, and maintaining such element in an ionized state in the immediate vicinity of such portions for permitting such ions to diffuse into the body surface.

3,645,711

METHODS OF MAKING OPAL GLASS ARTICLES

Perry P. Pirooz, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Original application July 14, 1967, Ser. No. 653,404, now abandoned. Divided and this application Jan. 19, 1970, Ser. No. 3,999
Int. Cl. C03b *29/00;* C04b *33/00*
U.S. Cl. 65—33 7 Claims

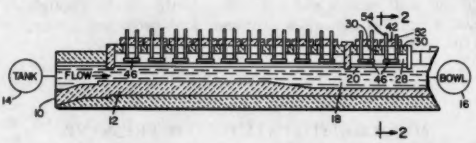
Methods of making thermally opalizable glass compositions suitable for use in making opal glass containers and low-expansion, heat resistant oven ware consisting essentially of SiO_2, Al_2O_3, B_2O_3, CaO, MgO and Na_2O in specified critical amounts. Preferably, an article is formed of the above glass composition, and heat treated to provide an in situ glass-in-glass phase separation by maintaining the article at a temperature in the neighborhood of 1,050° to 1,550° F. for about one-fourth to 8 hours.

3,645,712

RADIATION TARGET STRUCTURE AND USE TO COOL MOLTEN GLASS

Allen C. Ihrig, and Richmond W. Wilson, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 6, 1970, Ser. No. 35,055
Int. Cl. C03b *5/22*
U.S. Cl. 65—83 5 Claims



Adjustable, thin, fluid-cooled radiation targets are provided for selectively cooling the center surface portion of a molten glass stream in a glass making furnace forehearth. These radiation targets, which are generally of truncated triangular shape when viewed from an end in a direction parallel to the glass stream, may be arranged in tandem along the glass stream center surface portion, with each target having a plurality of connected wall panels defining a low-profile-closed chamber including a top portion spaced a substantial distance below the forehearth roof and inwardly converging side portions spaced a substantial distance from the glass stream edges. A plurality of spaced baffles within the closed chamber, and together therewith, define a circuitous fluid passageway having fluid entry and exit ports on the opposite ends thereof. Means are provided for supplying and removing a cooling fluid and further means control the degree of cooling imparted by the radiation target. A method for cooling the glass surface center portion includes positioning the radiation targets within a preselected region above the glass surface center portion and controlling the degree of cooling of the radiation targets.

3,645,713

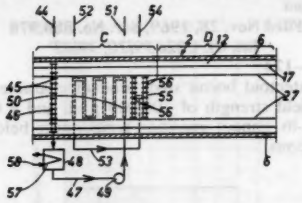
PROCESS FOR THE TREATMENT OR PRODUCTION OF FLOATING FLAT GLASS

Edgard Brichard, Jumet, Belgium, assignor to Glaverbel, Watermael-Boitsfort, Belgium

Filed Oct. 3, 1969, Ser. No. 863,656
Claims priority, application Great Britain, Sept. 5, 1969, 44,046/69
Int. Cl. C03b *18/02*
U.S. Cl. 65—99 A 5 Claims

A float tank used in the production or treatment of flat glass floating on a liquid bath has a refractory floor with

passageways formed therein. The passageways communicate with openings in different regions of the tank floor so that the



liquid may be circulated between these regions and thereby control or regulate the temperatures within the bath as may be desired.

3,645,714

BALANCED RELEASE PELLETED BARK PRODUCTS AND PROCESS

Elizabeth C. Heming; Warren W. Mathews, and William J. Wilson, all of Vancouver, British Columbia, Canada, assignors to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

Filed May 23, 1969, Ser. No. 827,172
Int. Cl. C05f *11/02*
U.S. Cl. 71—23 **5 Claims**

There is disclosed a method for producing the resultant pelleted products for horticultural and other purposes made up of bark from the group hemlock, balsam, spruce, pine, redwood, or mixtures thereof, said bark being blended with water-soluble nutrient fertilizer material. The blended mixture may contain other inert materials, such as wood, peat moss and the like, with or without the addition of other active ingredients, such as herbicides, pesticides, nutrients, and the like. These products readily disintegrate on contact with moisture in the soil and manifest balanced release characteristics.

3,645,715

ALGICIDAL AGENTS

Werner Daum, Krefeld-Bockum; Wilfried Paulus, and Otto Pauli, both of Krefeld, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 11, 1968, Ser. No. 783,134
Claims priority, application Germany, Dec. 27, 1967, P 16 43 384.4
Int. Cl. A01n *9/00, 23/00*
U.S. Cl. 71—67 **11 Claims**

Algicidal compositions of, and methods of combating algae including slime bacteria, using certain N-chlorophenyl-alkylene polyamines and their corresponding water soluble salts, some of which are known, which possess algicidal and slime bactericidal properties and which may be produced by conventional methods.

3,645,716

NEODECANOIC ACID AS A POSTEMERGENT HERBICIDE

Alfred J. Rutkowski, Colonia, N.J., assignor to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 687,145, Dec. 1, 1967, now abandoned. This application Oct. 3, 1969, Ser. No. 863,716
Int. Cl. A01n *9/04, 9/24*
U.S. Cl. 71—113 **5 Claims**

Neodecanoic acid, preferably formulated with a suitable solvent such as for example heavy aromatic naptha and a suitable emulsifier, such as for example, alkylated aryl polyether alcohol or a blend of anionic and nonionic emulsifiers, such as an alkylated aryl polyether alcohol plus a sulfonate has been found to be especially useful as a broad base postemergent herbicide when it is directly sprayed at the base of a growing crop at a time when the crop is at least twice the height of the weed. By using this acid in such a manner, it functions as a selective weed killer which does not cause injury to the crops when sprayed on a directed spray postemergence basis.

3,645,717

PROCESS OF PRODUCING SPONGE IRON PELLETS

Kurt Meyer, Frankfurt; Hans Rausch, Oberursel, and Wilhelm Thumm, Frankfurt, all of Germany, assignors to Metallgesellschaft A.G., Frankfurt am Main, Germany

Filed Apr. 9, 1969, Ser. No. 814,814
Claims priority, application Germany, Apr. 17, 1968, P 17 58 171.4
Int. Cl. C21b *13/08*
U.S. Cl. 75—33 **12 Claims**

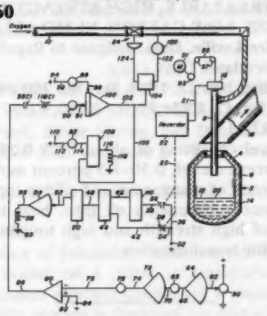
Improvements in the production of iron by the direct reduction of iron ore, wherein the iron ore is admixed with about 5 to 25 weight percent fine-grained metallic iron without any carbonaceous material added to the admixture; the admixture is pelletized and the pellets are fired at about 700° to 1,050° C. in either a slightly oxidizing, a neutral, or a slightly reducing atmosphere. The pellets produced by such firing have an iron to oxygen mol ratio of about 1:1 to 1:1.4. These pellets are then directly reduced with solid and/or gaseous reducing agents at about 650° to 1,250° C. but below the softening temperature of the charge. The product resulting from the reduction is about 70 to 100 weight percent metallic iron, has superior shrinkage as compared to prior art products, has a greater crushing strength and has a lesser tendency to reoxidize than prior art products.

3,645,718

METHOD FOR MAKING STEEL

Joseph A. Murphy, Murraysville, Pa., assignor to Crucible Inc.

Original application Oct. 9, 1967, Ser. No. 673,666, now Patent No. 3,598,386, dated Aug. 10, 1967. Divided and this application July 31, 1970, Ser. No. 64,936
Int. Cl. C21c *5/32*
U.S. Cl. 75—60 **4 Claims**



This invention relates to a method and apparatus for making steel in a converter top-blown with oxygen. In particular, the invention relates to operating a converter top-blown with oxygen by monitoring the temperature on the area of the bath surface contacted by the oxygen jet, which is the reaction zone, determining the reaction-zone temperature decrease indicating the end of desiliconization of the bath, and thereupon increasing the amount of oxygen and preferably also decreasing the height of the oxygen lance above the bath surface during the carbon-removal portion of oxygen blowing. The increased oxygen flow rate and decreased lance height is maintained for the remainder of the steelmaking operation.

3,645,719

SLAGGING IN BASIC STEEL-MAKING PROCESS AND COMPOSITIONS THEREFOR

William J. Minnick, Cheltenham, Pa., assignor to G. & W. H. Corson, Inc., Plymouth Meeting, Pa.

Filed Oct. 15, 1969, Ser. No. 866,727
Int. Cl. C22b 9/10
U.S. Cl. 75—94 10 Claims

In a basic steelmaking process wherein dolomite is charged as a slag-forming ingredient, the improvement wherein dolomite, prior to its charging, is intimately mixed with iron oxide in defined proportions, and formed into shaped bodies. In one preferred embodiment, the intimate mixture is prereacted, by heating, to convert the calcium oxide portion of the mixture into dicalcium ferrite with or without conversion of magnesium oxide to magnesio ferrite. Compositions for addition to a basic steelmaking furnace in the form of preformed bodies of an intimate mixture of dolomite and iron oxide or the stated ferrite or ferrites resulting from the aforesaid prereaction, are also provided.

3,645,720

METHOD OF DEOXIDIZING STEEL

Ryochiro Imai, and Yoshihiko Kawai, both of Kawasaki-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Aug. 4, 1969, Ser. No. 847,053
Claims priority, application Japan, Aug. 8, 1968, 43/55988
Int. Cl. C21c 7/06
U.S. Cl. 75—58 4 Claims

In a steel manufacturing process an oxygen concentration cell is immersed in the molten steel bath, the maximum differentiated value of the electromotive force is detected and the detected maximum value is utilized as the control factor for adjusting the quantity of deoxidizing agent to be subsequently added into the molten steel bath.

3,645,721

HEAT-TREATABLE, HIGH-STRENGTH, HIGH-TOUGHNESS, LOW-CARBON, NI-MO ALLOY STEEL

John Savas, Brecksville, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 25, 1968, Ser. No. 700,440
Int. Cl. C22c 39/36, 39/50, 41/00
U.S. Cl. 75—123 J 4 Claims

An alloy steel consisting of about 0.15–0.25 percent carbon, 8–12 percent nickel, 0.50–1.5 percent molybdenum, up to 1 percent each of manganese and silicon, up to 0.25 percent V, balance substantially all iron, heat treatable to a combination of high strength and high toughness with controlled austenitic transformation.

3,645,722

FREE MACHINING STAINLESS STEEL ALLOY

Grant M. Aulenbach, Mohnton, and Kermit J. Goda, Jr., Leesport, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Sept. 4, 1969, Ser. No. 855,416
Int. Cl. C22c 39/20, 39/14
U.S. Cl. 75—124 13 Claims

Stainless steel alloy containing about 10 to 30 percent chromium, 0.015 to 0.75 percent sulfur and/or selenium, 0.5 to 7 percent copper, 0.25 to 4 percent aluminum, 0.001 to 0.75 percent tellurium and the balance iron and optional elements. Ferritic and martensitic compositions are provided having improved free machining properties or an improved combination of free machining and corrosion-resistance properties in selected media.

3,645,723

QUENCHED AND TEMPERED LOW-ALLOY STEEL

John Y. Riedel, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Filed Nov. 28, 1969, Ser. No. 880,978
Int. Cl. C22c 39/20, 39/02
U.S. Cl. 75—124 4 Claims

A hypoeutectoid boron steel product characterized by a minimum yield strength of 100,000 p.s.i. and a Charpy V-notch 15 ft.-lb. impact transition temperature below −50° F. in thick sections.

3,645,724

STAINLESS STEEL

Robert L. Goldberg, 56 Wilshire Drive, Sharon, Mass.

Filed Feb. 10, 1969, Ser. No. 798,120
Int. Cl. C22c 39/14
U.S. Cl. 75—126 C 6 Claims

This invention is for a martensitic, heat hardenable steel of the following composition:

chromium	18 to 20%
molybdenum	0.2 to 0.8%
carbon	1.1 to 1.3%
boron	0 to 0.2%
iron	balance

The alloy is preferably heat tempered at a temperature of from 1,000° to 1,200° F. It is characterized by high-wear resistance, corrosion resistance in various media and a freedom from staining. These properties render the steel especially useful for the formation of surgical instruments having a sharp cutting edge.

3,645,725

AUSTENITIC STEEL COMBINING STRENGTH AND RESISTANCE TO INTERGRANULAR CORROSION

Elbert E. Denhard, Jr., Towson, and Robert R. Gaugh, Lutherville, both of Md., assignors to Armco Steel Corporation, Middletown, Ohio

Filed May 2, 1969, Ser. No. 821,460
Int. Cl. C22c 39/20
U.S. Cl. 75—128 A 4 Claims

Austenitic stainless steel characterized by a combination of good hot-rolling and good cold-rolling properties, good strength and ductility, and good welding properties, with resistance to intergranular corrosion in the as-welded condition. The steel contains about 17.5 to 22.5 percent chromium, about 5 to 9.5 percent nickel, at least 2.5 percent but less than 7 percent manganese, with a nitrogen content of about 0.2 to 0.4 percent, carbon not exceeding 0.040 percent, and remainder substantially iron. Where desired, there may be employed columbium in amounts up to about 1 percent and/or molybdenum up to about 3 percent. The steel is made available in the form of hot and cold flat-rolled products, as well as wire. It is suited to a wide variety of applications in the arts.

3,645,726

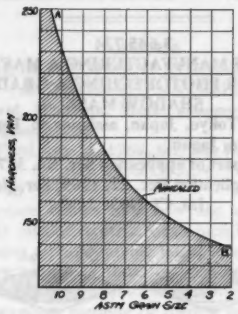
RESISTANCE TO STRESS-CORROSION CRACKING IN NICKEL ALLOYS

Harry R. Copson, Mahwah, N.J., and Sheldon W. Dean, Jr., Hamden, Conn., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed May 26, 1965, Ser. No. 459,050
Int. Cl. C22c 19/00
U.S. Cl. 75—171 6 Claims

Nickel-chromium and nickel-chromium-iron-base alloys having an improved level of resistance to intergranular stress-

corrosion cracking when in contact with aerated high-purity water at elevated temperatures. Alloys contain controlled



amounts of aluminum, titanium, silicon and carbon. Grain size and alloy hardness correlated to further minimize stress-corrosion attack.

3,645,727

METHOD FOR MELTING TITANIUM ALLOYS

Walter L. Finlay, New York, N.Y., and Howard B. Bomberger, Jr., Canfield, Ohio, assignors to Crucible Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 523,866, Feb. 1, 1966, now Patent No. 3,508,910. This application Oct. 28, 1969, Ser. No. 871,968

Int. Cl. C22c *1/02*

U.S. Cl. 75—175.5 **2 Claims**

This invention relates to a method of making a homogeneous ingot of a titanium base alloy by mixing particles of titanium with a master alloy in the form of fine granules, said master alloy containing 30 to 75 percent by weight of molybdenum, 25 to 70 percent by weight of at least one of the elements selected from the group consisting of chromium, titanium, zirconium, nickel and copper, but not over 30 percent chromium, not over 25 percent titanium, not over 40 percent zirconium, not over 10 percent nickel and not over 10 percent copper, compacting the mixture into the form of a compacted article and then melting said compacted article in a vacuum.

3,645,728

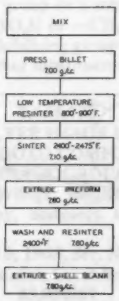
METHOD FOR MAKING SPARK PLUG SHELLS

John Hrinevich, Jr., Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 3, 1970, Ser. No. 43,001

Int. Cl. B22f *5/00*

U.S. Cl. 75—214 **4 Claims**



The invention relates to a method for making high-ductility spark plug shells including the steps of forming a relatively high-density annular billet of about 7.0 g./cc. from a mixture of iron powder and lubricant, sintering the billet at a relatively high temperature of at least 2,400° F. after heating at a substantially lower temperature to drive off lubricant, forming a shell preform from the sintered billet by forward and backward extrusion to produce a density of about 7.6 g./cc., sintering the preform at an elevated temperature in excess of 2,400° F. and extruding the resultant body to form a spark plug shell blank having a density of at least 7.8 g./cc., sintering being performed in a reducing atmosphere.

3,645,729

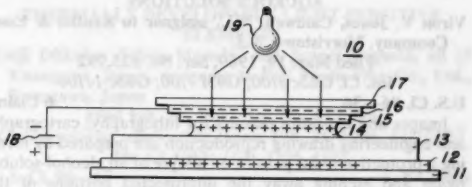
METHOD OF TRANSFERRING ELECTROSTATIC LATENT IMAGES USING MULTIPLE PHOTOCONDUCTIVE LAYERS

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Original application Sept. 23, 1966, Ser. No. 581,602, now Patent No. 3,539,255. Divided and this application Sept. 15, 1969, Ser. No. 870,821

Int. Cl. G03g *5/04*

U.S. Cl. 96—1 **4 Claims**



A photosensitive element comprising a photoconductive light controlled storage layer and adjacent thereto a photoconductive multiplying layer which has an electric field placed across the two layers. The storage layer is exposed to uniform illumination and subsequently the multiplying layer is exposed to the image illumination. Following the cessation of exposure and removal of the charging field, the two layers are stripped apart and the storage layer developed by a conventional method.

3,645,730

REPRODUCTION OF IMAGES USING LIGHT SENSITIVE CURABLE LIQUID POLYMERS

Victor S. Frank, Silver Spring, and Donald P. Gush, Hyattsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 11, 1968, Ser. No. 766,949

Int. Cl. G03c *1/68*

U.S. Cl. 96—28 **32 Claims**

Reproduction of printed or other images from a negative or positive master on a paper or transparency is possible using a laminated element containing a photocurable liquid polymer. A dry process is disclosed for preparing transparent positive and negative images in a single image exposure. The imagewise exposure is through a stencil, or a negative or positive transparency (halftone or line). The process, for example, includes placing a photocurable liquid polymer layer between two sheets, at least one of which is transparent, exposing the laminate to actinic or UV radiation through a negative image, and separating the sheets. Depending upon the system, a positive image is formed on the sheet proximate the light source and a negative image on the other sheet, or vice versa. The two sheets have different adhesive forces for cured and uncured photoadhesive compositions, which accounts for the adhesion of the cured and uncured to different sheets. The photocurable liquid polymer composition consists essentially of an ethylenically unsaturated polyene containing at least two reactive carbon to carbon bonds per molecule, a polythiol containing at least two thiol groups per molecule, a photocuring rate accelerator and black, white or colored fillers, pigments or dyes.

3,645,731

SILVER SALT DIFFUSION ALKALINE BATH OF TRISODIUM PHOSPHATE AND A POLYALCOHOL

Werner Liebe; Harald von Rintelen, both of Leverkusen, Germany; Gerard Laurens Vanreusel, Hove, and Camille Angelina Vandeputte, Mortsel, both of Belgium, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 9, 1970, Ser. No. 10,035
Claims priority, application Germany, Feb. 8, 1969, P 19 06 296.5
Int. Cl. G03c 5/54
U.S. Cl. 96—29 2 Claims

The modification of the silver salt diffusion process comprises exposure of a supported silver halide emulsion layer containing a photographic developer and development of the exposed layer with an alkaline Trisodiumphosphate bath while in contact with a nucleated image-receiving layer. The stability of the bath is improved by incorporating water-soluble aliphatic polyalcohols or polyamines.

3,645,732

ETCHING ALCOHOL-SOLUBLE NYLON WITH AQUEOUS SOLUTIONS

Viron V. Jones, Caldwell, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Mar. 19, 1969, Ser. No. 825,992
Int. Cl. G03c 5/00; G03f 7/00; G03c 11/00
U.S. Cl. 96—36 6 Claims

Images and exposure masters for lithography, cartography and engineering drawing reproduction are prepared by forming a protective resist pattern on a layer of an alcohol-soluble nylon and etching away the unprotected portions of the nylon layer with an aqueous solution of sodium salicylate. The nylon layer may include distinctly colored dyes for imaging purposes or may include actinically opaque dyes, pigments or light absorbers for the preparation of photographic reproduction master sheets. The present method employs aqueous media throughout and avoids the use of flammable organic solvents.

3,645,733

SUBTITLING OF PROCESSED PHOTOGRAPHIC MATERIALS

Eric Maria Brinckman, and Louis Achilles Meeussen, both of Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Mar. 27, 1969, Ser. No. 810,959
Claims priority, application Great Britain, Mar. 27, 1968, 14,779/68
Int. Cl. G03c 5/00, 5/04
U.S. Cl. 96—36 19 Claims

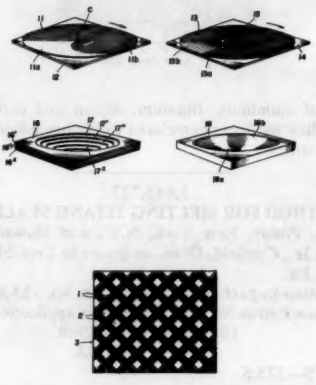
Graphic information, such as a subtitle, is recorded on a recording material, such as a motion picture film, by means of an externally applied surface layer of an organic film-forming polymer adapted to undergo a differential increase in solubility in an appropriate solvent as a result of imagewise heating so that, by contacting the differentially heated and thereby solubilized surface layer with the appropriate solvent, the relatively more soluble areas can be selectively removed, leaving the underlying areas of the recording material exposed. Heating can be effected directly within the surface layer by uniformly distributing throughout the polymer forming the same finely divided pigment or dye which, when exposed to a radiation image such as from a copying light, preferably a flashlight, absorbs such radiation and converts the same directly into heat. Where sufficient pigment or dye is present as to impart opacity to the surface layer, preferably an optical density of at least one, the graphic information can be formed by selective removal of the nonimage areas of the surface layer leaving an opaque relief image thereof to constitute the graphic information. Alternatively, the recording material with the partially removed surface layer thereon can be contacted with a liquid effectively bleaching the colorant material, i.e., the metallic silver or dye image, therein or, in the case of motion picture film, carrying a developed silver halide emulsion layer disintegrating the binder of that layer, or contains a dye which penetrates the exposed regions of the recording material.

3,645,734

PROCESS OF MANUFACTURING A MASTER DOT PATTERN FOR PHOTOETCHING A GRADED-HOLE SHADOW MASK

Kinich Noguchi, Tokyo, Japan, assignor to Toppan Printing Co., Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 387,724, Aug. 5, 1969. This application Dec. 22, 1969, Ser. No. 883,668
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 12 Claims



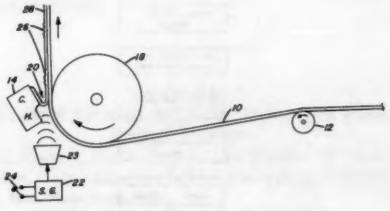
A process for the production of master dot patterns for photoetching a graded-hole shadow mask for use in a color picture tube including mounting a grading mask having its transparency concentrically, progressively decreasing from the center toward the periphery thereof between a light source and a photographic material and inserting a screen between the grading mask and the light source.

3,645,735

COATING BEAD MODULATION AND RECORDING THEREBY

Arthur Daniel Danielson; Lyle Charles Klier, both of Rochester, N.Y., and John D. O'Brien, Guadalajara, Jalisco, Mexico, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1969, Ser. No. 867,030
Int. Cl. G03c 1/00
U.S. Cl. 96—67 2 Claims



Thickness variations in the optical coating on a web may be employed for control, playback, and other purposes.

Coating thickness variations are produced by vibrating the coating bead. A photographic web is produced by vibrating the bead formed between an emulsion coating hopper and a web base, thereby to provide a light-sensitive web having record data manufactured therein.

3,645,736

PHYSICAL DEVELOPMENT SYSTEMS, PROCESSES AND RELATED MATERIALS

Lois E. Mowat, Waltham, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed July 11, 1968, Ser. No. 743,983
Int. Cl. G03c 5/54
U.S. Cl. 96—48 8 Claims

This disclosure relates to a new and useful complex of silver ion with nitrilotriacetate ions which is particularly useful in sensitizing a photographic latent image on a photosensitive medium especially those in which the photosensitive component is a photoconductor. The complex can be applied to the photoexposed medium or formed on the medium before or during photoprocessing. Also described are methods of photoprocessing latent photographic images, especially by amplifying latent silver images with nonsilver metals such as copper and tin.

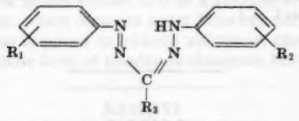
3,645,737

SILVER HALIDE PHOTOGRAPHIC PROCESSING USING FORMAZANS

Eric Macdonald, Llanbrynmair, Wales, assignor to Ilford Limited, Essex, England

Filed Jan. 23, 1969, Ser. No. 793,553
Claims priority, application Great Britain, Jan. 26, 1968, 4,303/68
Int. Cl. G03c 7/00
U.S. Cl. 96—55 3 Claims

This application describes a process of color development of color photographic material wherein at least one silver halide emulsion layer containing a developable silver salt is color developed to yield a dye image, the developed silver and the residual silver halide being removed, the step of developing the photographic material with a color developing solution in the presence of an image-forming color coupler and a formazan compound of the formula:



wherein R_1 and R_2 are each selected from hydrogen atoms or solubilising groups and R_3 is a hydrogen atom or an aryl, alkyl, aralkyl or a —CN group or a solubilising group selected from —COOH, $-CH_2SO_3H$ or $-CH_2COOH$, at least one of R_1, R_2 or R_3 being a solubilising group, the two phenyl groups optionally carrying further substituents.

3,645,738

STABILIZING SILVER IMAGE IN PRESENCE OF HETEROCYCLIC THIOXO COMPOUND CONTAINING SULPHOGROUP

Jozef Frans Willems, Wilrijk, Belgium, and Oskar Riester, Leverkusen, Germany, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed May 10, 1968, Ser. No. 728,321
Claims priority, application Great Britain, May 18, 1967, 23,050/67
Int. Cl. G03c 5/38
U.S. Cl. 96—61 10 Claims

A rapid process for producing a stable photographic image is disclosed which comprises developing an exposed silver halide emulsion layer of a photographic material and treating the developed emulsion layer with a stabilizing solution containing a stabilizing agent such as ammonium thiocyanate and a heterocyclic thioxo compound showing thioxo-thiol tautomerism and corresponding to the formula

wherein Z represents the atoms necessary to close a five or six member heterocyclic nucleus containing at least one sulfo group in acid or salt form. The residual unexposed and undeveloped silver halide which is left in the emulsion layer forms a light inert complex. The thioxo-thiol compound improves the stability of the produced image to light, heat, and humidity.

3,645,739

THERMALLY DEVELOPABLE LIGHT-SENSITIVE ELEMENTS

Kinji Ohkubo; Takao Masuda, and Junpei Noguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 21, 1967, Ser. No. 617,498
Claims priority, application Japan, Feb. 21, 1966, 41/10383
Int. Cl. G03c 1/76, 1/06, 1/02
U.S. Cl. 96—67 8 Claims

A photographic light-sensitive element capable of providing stable images by a thermal development, having a light-sensitive layer containing benzotriazolyl silver, a silver halide or an organic halide capable of forming a silver halide by the reaction with benzotriazolyl silver, a reducing agent, and an organic acid or a salt thereof.

3,645,740

PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE ELEMENT WITH GELATIN SUBBING LAYER

Fumihiko Nishio; Nobuo Tsuji; Teppei Ikeda, and Hideo Kawaguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1970, Ser. No. 3,201
Claims priority, application Japan, Jan. 16, 1969, 44/3041
Int. Cl. G03c 1/80
U.S. Cl. 96—87 R 8 Claims

A photographic element having a subbing layer comprising at least one member selected from the group consisting of (1) a glycidyl methacrylate homopolymer, (2) a glycidyl acrylate homopolymer, (3) a copolymer of glycidyl methacrylate and a copolymerizable vinyl compound, (4) a copolymer of glycidyl acrylate and a copolymerizable vinyl compound which prevents sticking of the photographic element is disclosed.

3,645,741

DIAZOTYPE LIGHT-SENSITIVE MATERIAL FOR INTERMEDIATE ORIGINAL

Syuhei Shiraishi, Fujisawa-shi, and Tadashi Saito, Yokohama-shi, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Jan. 2, 1970, Ser. No. 389
Claims priority, application Japan, Jan. 9, 1969, 44/1786
Int. Cl. G03c 1/58
U.S. Cl. 96—91 4 Claims

There is provided a diazotype light-sensitive material for intermediate original (or substitute original), the light-sensitive material being able to give a dye-image which is easy to see and has low transmission of ultraviolet rays. Said material contains derivative of 1-hydroxynaphthalene-3,8-disulfonic acid as one coupling component together with diazonium compound in the light-sensitive layer.

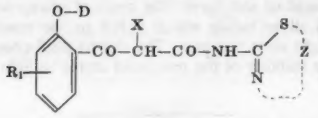
3,645,742

COLOR PHOTOGRAPHY

Marcel Hendrik Verbrugghe, Wilrijk; Arthur Henri De Cat, Mortsel, and Marcel Karel Van Doorselaer, S-Gravenwezel, all of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Nov. 27, 1968, Ser. No. 779,627
Claims priority, application Great Britain, Jan. 5, 1968, 854/68
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 12 Claims

Light-sensitive silver halide emulsions comprising a yellow-forming color coupler having the formula



wherein:
X stands for hydrogen or a group which splits off on color development,
D represents a residue rendering the molecule fast to diffusion and comprising from five to 20 carbon atoms,
R_1 stands for hydrogen, alkyl, alkoxy, halogen, a dialkylamino group or a sulphamoyl group, and
Z represents the atoms necessary to close a nucleus of the thiazole series,
are described. Upon color development of the described emulsions yellow azomethine dyes are formed which have a high stability against heat and moisture and possess favorable spectral properties.

3,645,743

PROCESS FOR HARDENING PROTEIN LAYERS

Bruno Mucke, Koeln-Buchheim; Karl Lohmer, Leverkusen, and Heinrich Gold, Koeln-Stammheim, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 8, 1969, Ser. No. 848,717
Claims priority, application Germany, Aug. 27, 1968, P 17 95 237.3
Int. Cl. G03c *1/30*
U.S. Cl. 96—111 5 Claims

A process for hardening photographic gelatin layers, wherein a dihalogen substituted di- or triazine is added as hardening agent to the casting solution for the photographic layer; the casting solution is applied onto the support and the layer is dried. The drying the performed in effective contact with a water-soluble salt of a primary, secondary or tertiary amine.

3,645,744

PHOTO- AND HEAT-SENSITIVE COMPOSITIONS

Brazelton Fulkerson, and John W. Mench, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1969, Ser. No. 788,650
Int. Cl. G03c *1/68, 1/86, 1/94*
U.S. Cl. 96—115 4 Claims

It has been discovered that coatings of cellulose propionate 3-morpholinobutyrate are sensitive to heat and light, such sensitive being illustrated by the insolubilization of the polymer that occurs upon exposure to such energy. Such coatings are useful as radiation-sensitive photoresists.

3,645,745

METHOD OF PRODUCING A SOLUBLE PROTEIN PRODUCT

Pete J. Magnino, Jr., and Christopher W. Frederiksen, both of St. Louis, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed July 8, 1968, Ser. No. 743,034
Int. Cl. A23j *1/14*
U.S. Cl. 99—17 21 Claims

Producing a soluble protein product from oleaginous seed materials which involves altering the physical structure of the protein molecules by subjecting to a solution having a pH range from 1 to 2 or from 10 to 12 and heating said liquid portion to 85° to 350° F., later precipitating the protein and, subjecting an aqueous suspension of this precipitated protein to instantaneous heat and pressure, then passing through a zone of lower pressure and converting the protein to a dry, particulate protein product. This soluble protein may be used to produce protein-enriched food products and is particularly desirable for use in clear or transparent food products or foods where high solubility is desired, since said protein is very soluble and, therefore, does not distract from the physical properties of a clear food product.

3,645,746

PRESERVATION OF PROTEINACEOUS MATERIALS AND EDIBLE FIBERS SPUN THEREFROM

William T. Akinson, Minneapolis, Minn., assignor to Archer Daniels Midland Company, Minneapolis, Minn.

Filed Feb. 7, 1969, Ser. No. 797,668
Int. Cl. A23j *1/14;* A23l *1/20*
U.S. Cl. 99—17 12 Claims

A process for preserving aqueous proteinaceous materials, e.g. soy flour, and the process of spinning edible fibers comprising the steps of:

I. heating the proteinaceous material to a temperature of above 140° F. in aqueous slurry, and then
II. treating a mixture of the heat-treated protein, a water soluble alginate and water with peroxide,
II. adding carrageenin before or after heat treatment, and then
IV. spinning the mixture into a coagulating bath, e.g. aqueous $CaCl_2$.

3,645,747

METHOD OF PRODUCING A SIMULATED MEAT

Hugh C. Palmer, Pacific Palisades, Calif., assignor to Kal Kan Foods, Inc., Vernon, Calif.

Filed July 25, 1969, Ser. No. 845,070
Int. Cl. A23j *1/14*
U.S. Cl. 99—17 7 Claims

An edible product simulating meat in texture and appearance composed in major part of a vegetable protein mass having an internal structure stretched into the form of fibers, filaments and tissuelike membranes coagulated from a viscoelastic state to stable attenuated form. In making the product, a slurry with water of a vegetable protein material having viscoelastic properties similar to those of vital wheat gluten is heated to reduce the permeability to gases of the exposed surface of the material by coagulation thereof, after which the material is treated to generate gases internally of the mixture and to cause the gases to expand while their escape is inhibited by the lower permeability of the said surface so that the mixture enlarges in volume and becomes internally attenuated, after which the attenuated mixture is coagulated to a denatured product.

3,645,748

POTATO STRIP AND METHOD OF PRODUCING FRENCH FRIED POTATOES

Laurence James Ilines, 7 Feldbar Court, Willowdale, Ontario, Canada

Filed Mar. 22, 1967, Ser. No. 625,231
Int. Cl. A23l *1/12*
U.S. Cl. 99—100 5 Claims

An uncooked strip of extruded potato mix having an elongated body and a polygonal cross section defined by concave sides of predetermined radius of curvature substantially equal to the mean of the longest and shortest dimension of the cross section of the strip meeting at rounded corners, said rounded corners having a predetermined radius of curvature which is substantially equal to about one-eleventh of the radius of said concave sides, the concave sides being deformable by cooking to acquire a flat condition while said rounded corners remain unchanged.

3,645,749

ELECTROLESS PLATING BATHS WITH IMPROVED DEPOSITION RATES

Milan Paunovic, Port Washington, N.Y., assignor to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.

Filed June 4, 1970, Ser. No. 43,553
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 12 Claims

There are provided compositions comprising imino compounds, specifically, ethoxylated cyclohexylamines and benzyliminodiacetic acid, complexed with copper ions. These compositions in aqueous alkaline media, in the presence of a reducing agent, provide baths for the autocatalytic electroless deposition of the copper metal. The new baths have improved stability and plating rates.

3,645,750

ALUMINOUS CEMENT-TRICALCIUM SILICATE BINDERS

Gerard Henri Sadran, Paris, France, assignors to Ciments Lafarge S.A., Paris, France

Filed Dec. 16, 1968, Ser. No. 784,239
Claims priority, application France, Dec. 22, 1967, 133633
Int. Cl. C04b *7/32*
U.S. Cl. 106—104 7 Claims

Aluminous cements are disclosed containing tricalcium silicate. The tricalcium silicate acts as a delayed-action water-binding agent, which removes water from cement mortars in excess of that required to hydrate aluminous cement to the stable crystalline form of tricalcium aluminate hexahydrate.

3,645,751

PREPARING CHEESE CURD

Alden H. Wakeman, Lake Mills, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of application Ser. No. 754,823, Aug. 23, 1968, now abandoned. This application Jan. 20, 1971, Ser. No. 108,012
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 6 Claims

A continuous process for preparing cheese curd from milk which includes the sequential steps of (a) deaerating the milk, (b) cooling the deaerated milk, (c) adding acid to the cooled milk in a manner which provides substantially instantaneous acidification of the milk but which avoids localized overacidification, (d) immediately heating the acidified milk by passing it through heat exchange means to coagulate the curd-forming elements in the milk and form curd, (e) periodically momentarily reversing the flow of the coagulating milk during passage through the heat exchange means, (f) cutting the formed curd as it emerges from the heat exchange means, (g) cooking the cut curd, (h) cooling the cooked curd, (i) draining the whey from the curd and (j) washing the curd.

3,645,752

METHOD OF MAKING STABILIZED IMPREGNATED PEANUTS

James R. Baxley, Edenton, N.C., assignor to Peanut Research & Testing Laboratories, Inc.

Filed Oct. 3, 1969, Ser. No. 863,712
Int. Cl. A23l *1/36*
U.S. Cl. 99—126 3 Claims

Highly stable, flavor impregnated peanuts are produced by first pressing out a substantial portion of the natural oil. The pressed, partially defatted peanuts are then oil roasted to reconstitute the nuts back to their original shape and size. After oil roasting, the nuts are drained and while still hot transferred to a second oil bath of a substantially lower temperature than the first. This quenches the roasting treatment and releases vacuum developed within the nut oil cells by the reconstitution process. In the second oil bath, the oil replaces the natural oil in the nut, the replacement oil preferably being of a high-stability type. Flavor impregnants may be included in the second oil bath, as desired.

3,645,753

MEAT-FLAVORING COMPOSITION

Rupert Josef Gasser, Kempttal, Switzerland, assignor to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed July 10, 1970, Ser. No. 53,989
Claims priority, application Great Britain, June 5, 1970, 27,262/70
Int. Cl. A23l *1/22*
U.S. Cl. 99—140 R 6 Claims

A meat-flavored composition is prepared by heating together yeast autolysate, vegetable protein hydrolysate, hydrolysed meat extract and lactic acid, under specific conditions. Other features of the invention are disclosed in the specification.

3,645,754

MEAT FLAVOR AND ITS PREPARATION

Charles Wiener, Middletown, N.Y., assignor to Polak's Frutal Works, Inc., Middletown, N.Y.

Filed Aug. 1, 1968, Ser. No. 749,276
Claims priority, application Great Britain, Aug. 11, 1967, 37,099/67
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R 3 Claims

A process for the preparation of a meat flavor and to food products containing this flavoring substance. The present invention provides a process for the preparation of a meatlike flavoring substance which comprises reacting certain sulfide or hydrosulfide sulfur compounds with certain carbohydrates preferably in the presence of a solvent.

3,645,755

NOVEL SPIRO COMPOUND AND BLACK TEA COMPOSITIONS CONTAINING THE SAME

Yajiro Sakato; Kazuo Ina, both of Iwata-shi; Yukitsune Yamamoto, Kyoto-shi, and Harumi Morishita, Hamamatsu-shi, all of Japan, assignors to Kaken Kogyo Kabushiki Kaisha, Senhoku-gun, Osaka-fu, Japan

Filed Jan. 21, 1969, Ser. No. 792,810
Claims priority, application Japan, Jan. 26, 1968, 43/4856
Int. Cl. A23l *1/22*
U.S. Cl. 99—140 R 18 Claims

1-oxa-8-oxo-2,6,10,10-tetramethyl-spiro-[4,5]-6-decene; compositions for improving aroma and flavor of black tea which contain the above compound; and black tea containing the above compound.

3,645,756

FLAVORING MATERIAL PREPARED FROM ONIONS

Heinz Huth, Wiesenweg 33a, 345 Holzminden, Germany

Filed Aug. 15, 1969, Ser. No. 850,646
Claims priority, application Austria, Aug. 16, 1968, A 8011/68
Int. Cl. A23l *1/22, 1/02*
U.S. Cl. 99—140 R 4 Claims

Flavoring material is prepared from onions by expressing their juice, flash heating, cooling and concentration. Condensate from the vapor evolved during concentration can be extracted and used as well.

3,645,757

FOOD PACKAGING METHOD EMPLOYING RELEASE AGENT COATED PACKAGING MATERIAL

Arthur L. Gordon, Des Plaines, and Leonard A. Warwick, Niles, both of Ill., assignors to Kraftco Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 654,041, July 10, 1967, now Patent No. 3,519,470. This application May 28, 1970, Ser. No. 41,635
Int. Cl. B65b *25/06*
U.S. Cl. 99—171 CA 5 Claims

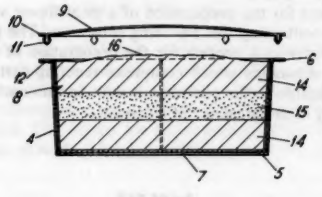
An improved package for moisture-containing food products and a method for providing improved release properties for such food products is provided. The release properties are provided by a thin film or layer of a suitable readily hydrated hydrocolloid. Suitable hydrocolloids may be selected from pregelatinized starches, modified cellulose materials or mixtures thereof.

3,645,758

PACKAGE FOR A LAYER CAKE

John MacManus, 143-16 Twenty-second Road, Whitestone, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,293
Claims priority, application Great Britain, Mar. 7, 1969, 12,264/69
Int. Cl. B65d *43/10, 85/36*
U.S. Cl. 99—172 8 Claims



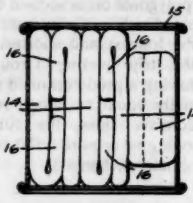
A cylindrical transparent outer container has an open top. A removable baseboard is inserted through the open top of the container and rests on inturned flanges at the bottom of the sidewall of the container. A discontinuous transparent liner fits with its free ends abutting one another nesting inside and against the inner wall of the container and resting on the baseboard. A layer cake fits snugly within the liner so that the one or more layers of filling are sealed between the layers of baked cake by the engagement of the edges of the layers of baked cake against the liner.

3,645,759

METHOD OF PACKING FLEXIBLE PACKAGES IN A CYLINDRICAL CONTAINER

Fred Heiligman, Framingham, Mass., assignor to The United States of America as represented by the Secretary of the Army

Filed June 25, 1970, Ser. No. 49,703
Int. Cl. B65b *25/06*
U.S. Cl. 99—174 4 Claims



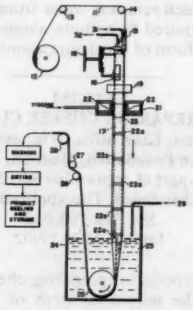
A method of packing a plurality of substantially flat elongated flexible packages in a rigid cylindrical container where the length of the packages exceeds the interior height of the container comprising folding the flexible packages transversely to a length which is less than the interior height of the container and providing a folded end portion which is less than half the interior height of the container, stacking the folded packages in pairs with their folded end portions in the same plane, placing the stacked pairs into the container and filling the remaining space between the container wall and the stacked pairs with a single flexible package folded at least twice transversely and placed sidewise in the container. The method is particularly useful in packing five 1-pound packages of sliced bacon in a standard size (No. 10) tin plate container.

3,645,760

DRY SAUSAGE CASING

Merril N. O'Brien, 1717 N. Logan, and Albin F. Turbak, 215 Denvale Drive, both of Danville, Ill.

Filed Jan. 5, 1970, Ser. No. 7,297
Int. Cl. A22c *13/00*
U.S. Cl. 99—176 9 Claims



A synthetic tubular sausage casing for processing dry sausages is prepared by impregnating or coating a reinforcing paper, preferably a saturating tissue, with a solution or dispersion of a water-soluble or dispersible protein, having a molecular weight above about 10,000 and an isoelectric point in the range from pH 2 to pH 6. The solution or dispersion is of a concentration such that the protein is impregnated in or coated on the paper at a concentration of about 0.1 percent –6.0 percent based on dry weight of the

paper. The paper coated or impregnated with protein is cross linked by reaction with a nontoxic cross-linking agent (nontoxic in the resulting product). The coated or impregnated paper is then formed into a tubular casing and impregnated with viscose or other suitable material which is hardened or regenerated in and upon the protein saturated or coated paper reinforcement.

ERRATUM

For Class 106—1 see:
Patent No. 3,645,749

3,645,761
GLASS SOLDER

Susumu Kawamura, and Fumio Yamaguchi, both of Otsu-shi, Japan, assignors to Nippon Electric Glass Company, Limited, Tokyo, Japan

Filed Nov. 24, 1969, Ser. No. 879,558
Claims priority, application Japan, Dec. 23, 1968, 43/93768
Int. Cl. C03c *3/10, 3/04, 3/08*
U.S. Cl. 106—53 **1 Claim**

A glass solder composition comprising a mixture of a major portion of lead oxide, bismuth trioxide, boron trioxide, zinc oxide, silicon dioxide, and a minor amount of additional oxide chosen from one or more of the group of sodium monoxide, potassium monoxide, lithium oxide and barium oxide.

3,645,762
HYDRAULIC MORTAR OR CEMENT COMPOSITION

Franz Mikoteit, Neubeckum, and Hans-Joachim Tennstedt, Enniger, both of Germany, assignors to Elsa Zement- und Kalwerke Aktiengesellschaft, Neubeckum, Westphalia, Germany

Filed Apr. 17, 1970, Ser. No. 29,682
Claims priority, application Germany, Apr. 25, 1969, P 19 21 084.5
Int. Cl. C04b *7/02*
U.S. Cl. 106—89 **6 Claims**

A hydraulic mortar or cement composition which is suitable for application by spray coating and useful in sealing the walls of galleries in coal mines or other excavations, comprises limestone marl containing a small concentration of clay, slightly burnt and completely deacidified cement clinker, and a small amount of an anhydrous calcium salt such as calcium chloride to accelerate initial hardening.

3,645,763
COMPOSITION FOR ELIMINATING EFFLORESCENCE IN PORTLAND CEMENT PRODUCTS

Anthony R. Ronzio, and Bernard T. Pull, both of Littleton, Colo., assignors to Bio-Organic Chemicals, Inc., Denver, Colo.

Filed Apr. 15, 1970, Ser. No. 28,951
Int. Cl. C046b *13/24*
U.S. Cl. 106—90 **7 Claims**

A composition comprising polyvinyl alcohol characterized by high-molecular weight and viscosity and very low solubility of insoluble in water, mixed with barium hydroxide or barium oxide, and added to Portland cement in the proportion ranging from 3/4 to 5 percent of the alcohol to 100 percent of the cement, effective to prevent bleeding of salts out of the cement and thereby markedly lessen or eliminate efflorescence in Portland cement products.

3,645,764
METHOD OF PRODUCING HIGH-STRENGTH CONSTRUCTION COMPOSITIONS OF A MIXTURE OF SOIL, PORTLAND CEMENT AND ASPHALT

Michael Stram, Chicago, Ill., assignor to Sinclair Oil Corporation, New York, N.Y.

Filed Dec. 6, 1968, Ser. No. 781,961
Int. Cl. C04b *7/02*
U.S. Cl. 106—96 **8 Claims**

There are disclosed high-strength construction compositions comprising a mixture of soil, Portland cement and asphalt, and a method of producing such compositions. The wet compressive strength of compositions containing a mixture of soil and asphaltic binder is significantly increased by the addition of Portland cement.

ERRATUM

For Class 106—104 see:
Patent No. 3,645,750

3,645,765
CARBON BLACK PELLETING AGENT

Arthur E. Frazier, and Robert E. Dollinger, both of Borger, Tex., assignors to Phillips Petroleum Company

Filed Nov. 20, 1968, Ser. No. 777,490
Int. Cl. C09c *1/58*
U.S. Cl. 106—307 **5 Claims**

A carbon black pelleting agent which acts as a pelleting agent and which acts to disperse the carbon black in rubber which comprises an aqueous solution of a polyethyoxylated fatty acid.

3,645,766
METHOD FOR DRYING AND STORING DRY FLOWERS AND LEAVES

Pietro Mazzucato, and Gino Mazzucato, both of Via S. Fermo 5, Padova, Italy

Filed Apr. 16, 1969, Ser. No. 816,821
Claims priority, application Italy, Apr. 17, 1968, 31819 A/68; Nov. 22, 1968, 31878 A/68
Int. Cl. A01n *3/02*
U.S. Cl. 117—3 **1 Claim**

A drying and storing method, particularly fitted for flowers and leaves, wherein the vegetables are delicately immersed in a suitably heated powder material having a high absorbing power, so that dehydration process gradually occurs in the absence of light and active atmosphere gases, whereupon the dried flower is preheated to paraffin melting temperature and immersed for a few minutes in a melted paraffin or wax bath, then removed and cooled down to room temperature.

3,645,767
PROCESS FOR COATING CERAMIC MOLDS

Percy Ronald Taylor, Wrexham, Wales, England, assignor to Monsanto Chemicals Limited, London, England

Filed Feb. 12, 1970, Ser. No. 10,980
Claims priority, application Great Britain, Feb. 19, 1969, 9,061/69
Int. Cl. B44d *1/20;* **B29c** *1/04*
U.S. Cl. 117—5.1 **1 Claim**

The walls of the pattern cavity of a fired ceramic mold for use in metal casting are coated with a dispersion in a liquid medium of a particulate solid selected from graphite, molybdenum disulphide and aluminum and the liquid medium is evaporated to leave a deposit of the particulate solid of such thickness that the dimensions of the pattern cavity are not significantly altered. The coating reduces or eliminates mold-metal interaction thereby facilitating separating of the mould from the casting.

3,645,768

FOAMABLE RESINOUS MATERIALS

Charles E. Coco, Shillington, and Suzanne M. Garszczynski, Reading, both of Pa., assignors to Wyomissing Corporation

Filed Mar. 7, 1968, Ser. No. 711,438
Int. Cl. B44d 5/00; B32b 5/18
U.S. Cl. 117—8 3 Claims

A foamable resin system is provided that is especially adapted to be applied to a substrate in the form of a smooth, flexible, nontacky coating. The system has a unique combination of properties including a long shelf life, the ability to be foamed at relatively low temperatures (for example, below the softening or mobility point of the base resin), and the ability to rigidify at temperatures approximating foaming temperatures. The invention makes use of plasticizers for the resin that are inactive or inactivated at ambient temperatures, that are effective to soften the resin at foaming temperatures, and that may be dissipated or otherwise pacified at foaming temperatures.

3,645,769

DISPOSABLE TISSUE

Charles Willey, 205 West 23rd; Walter R. Willey, 1103 East 10th, both of Pittsburg, Kans., and Charles R. Willey, 1415 Sargent, Joplin, Mo.

Continuation of application Ser. No. 578,468, Sept. 12, 1966, now abandoned. This application June 22, 1970, Ser. No. 48,530
Int. Cl. B44d 1/40
U.S. Cl. 117—16 4 Claims

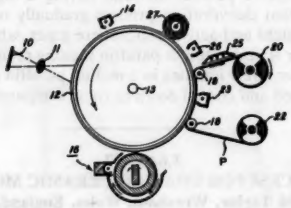
A disposable tissue such as toilet tissue which is impregnated with 0.5–2.5 percent by weight of the paper article by a viable yeast.

3,645,770

IMPROVED METHOD FOR DEVELOPING XEROGRAPHIC IMAGES

Thomas J. Flint, Herkimer, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Original application Apr. 22, 1968, Ser. No. 723,041, now Patent No. 3,552,355. Divided and this application Apr. 16, 1970, Ser. No. 33,117
Int. Cl. G03g 13/22
U.S. Cl. 117—17.5 1 Claim



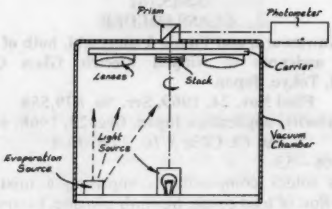
An improved method for developing latent electrostatic images by forming a surface coating of developer material including a magnetic component and an electroscopic component, transporting the coating of developer material along a path past latent electrostatic images to be developed, and uniformly charging the outer surface of the coating of a polarity opposite that of the latent electrostatic images. At development an outer layer portion of the coating is deflected into close proximity with the latent images to be developed and oscillating toward and away from the images in the development zone to effect a continuous undulating flow pattern of the outer layer of the coating.

3,645,771

MULTILAYER BLOOMING PROCESS INCLUDING PRECOATING OF THE SUBSTRATE USED FOR MONITORING

John Ward, Elizabeth Park, South Australia, Australia, assignor to The Commonwealth of Australia, c/o the Secretary, Department of Supply, Canberra, Australia

Filed May 7, 1969, Ser. No. 822,632
Claims priority, application Australia, May 10, 1968, 37634
Int. Cl. B29d 11/00; C03c 13/00
U.S. Cl. 117—33.3 8 Claims



A method of carrying out multilayer blooming which includes means to more accurately measure the thickness of the layers during blooming which consists in the use of a stack having at least one layer thereon to enhance the light transmission or reflection difference as the blooming layers are deposited on the stack during blooming of the articles, the stack preferably comprising a substrate having precoated thereon alternately high and low refractive index materials having an optical thickness of a quarter wavelength or multiples thereof at a selected wavelength.

3,645,772

PROCESS FOR IMPROVING BONDING OF A PHOTORESIST TO COPPER

John Lester William Jones, New Shrewsbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 30, 1970, Ser. No. 51,393
Int. Cl. B44c 1/22; B44d 1/34; G03c 1/94
U.S. Cl. 117—34 8 Claims

A process for improving the bonding of photoresist layers to copper surfaces by exposing the copper surface to the action of a nitrogen-containing organic compound containing at least one other hetero-atom and at least one five- or six-membered ring. A photoresist layer is then applied to the treated copper surface. Ethanol and other solutions of the nitrogen-containing compounds are effective.

3,645,773

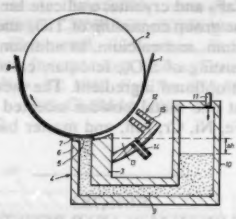
PROCESS FOR COATING SUBSTRATES IN STRIP-FORM WITH PHOTOGRAPHIC EMULSION

Peter Herzhoff, Leverkusen; Hans Gref, Cologne-Stammheim; Fritz Maus, Cologne-Flittard; Wolfgang Schweicher; Willi Wasser, both of Leverkusen; Kurt Browatski, Lagenfeld, and Josef Friedsam, Opladen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 10, 1969, Ser. No. 797,808
Int. Cl. B44d 1/12; B05c 3/12; G03c 1/74
U.S. Cl. 117—34 2 Claims

A process for coating a viscous solution by a wetting process on a movable substrate. The coating solution is

formed by a narrow gap between coating apparatus and the movable substrate so that the narrow gap is part of a coating



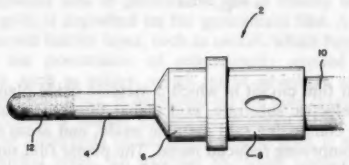
chamber of the coating apparatus. The coating chamber is connected to a vacuum means at the side of the coating apparatus from which the substrate is introduced.

3,645,774

GOLD COATING BY SALT DECOMPOSITION

John Thomas Schreck, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 15, 1969, Ser. No. 858,061
Int. Cl. B44d *1/44*; C23c *17/02*
U.S. Cl. 117—46 CA 3 Claims



Nickel substrate is provided with a thin gold coating or plating by depositing a mixture of potassium gold cyanide and petrolatum on the surface and heating the surface to a temperature sufficient to cause decomposition of the potassium gold cyanide and removal of the petrolatum.

3,645,775

PROCESS FOR PRODUCTION OF AN ARTIFICIAL LEATHER AND PRODUCT

Helmut Schulze, Bodelschwingstr. 34, and Gerhard Seibert, Bergweg 13, both of Erlenbach, Germany

Filed Dec. 12, 1969, Ser. No. 884,731
Claims priority, application Germany, Dec. 17, 1968, P 18 15 043.1
Int. Cl. D06n *3/00*; B32b *27/40*
U.S. Cl. 117—63 7 Claims

Process of producing an artificial leather by coagulating or hardening a polyurethane gel applied to a substrate into a microporous layer which is permeable to water vapor, wherein a silicone oil is added to the initial gelable solution of the polyurethane in an organic solvent.

3,645,776

PROCESS FOR PREPARATION OF LEATHERLIKE SHEET MATERIAL WITH EXCELLENT LASTABILITY

Shogo Nakajo, Nishinomiya, and Yoshitami Saito, Kurashiki, both of Japan, assignors to Lurarayy Co., Ltd., Kurashiki, Japan

Filed Nov. 12, 1968, Ser. No. 775,141
Claims priority, application Japan, Nov. 21, 1967, 42/74906, Jan. 23, 1968, 43/4133
Int. Cl. B44d *1/44*
U.S. Cl. 117—64 15 Claims

Leatherlike sheet material is prepared by impregnating a nonwoven fibrous mat or napped cloth with a solution of polymeric material, coagulating the solution by wet method to form a homogeneous fine sponge structure without sticking to the fibers and then contacting the impregnated mat or cloth with a heated surface at an elevated temperature above softening temperature of the polymeric material to soften the polymeric material and to form a thin polymer film on the surface of the impregnated mat or cloth.

3,645,777

PROCESS OF COATING GLASS WITH DURABLE COATINGS AND RESULTING PRODUCTS

Theodore B. Sierad, Harrison, N.Y., assignor to The Brudenell Corporation, Port Washington, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,962
Int. Cl. C03c *17/32*; C23c *3/02*
U.S. Cl. 117—71 R 8 Claims

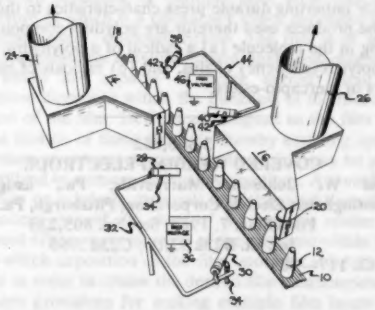
A glass coating composition comprising 30 to 57 parts by weight of a butylated urea formaldehyde, 10 to 35 parts by weight of a partially hydrolyzed copolymer of vinyl acetate and vinyl chloride, and 27 to 45 parts by weight of a hydrogenated furfuraldehyde ketone useful in the application of decorative coatings to glass articles and the like, including various types of electrical lamps wherein a colorful effect is obtained.

3,645,778

METAL OXIDE COATINGS ON GLASS

Edward P. Nesteruk, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Jan. 6, 1969, Ser. No. 789,199
Int. Cl. B05b *5/02*
U.S. Cl. 117—93.4 14 Claims



While being nonrotatably transported along a flight conveyor, glass containers are electrostatically treated with colored metal oxide film-forming organometallic compounds. The organometallic compounds are electrostatically sprayed in a nonflammable solvent system containing a halogenated solvent while a horizontal flow of air is provided across the flight conveyor in impinging relation with respect to the container being treated.

3,645,779

METHOD OF COATING A TRANSPARENT SYNTHETIC POLYMER SUBSTRATE WITH BORON OXIDE-SILICON DIOXIDE GLASS

Gerhard Kienel, Hanau, Main, Germany, assignor to Leybold-Heraeurs-Verwaltung GmbH, Koln-Bayental, Germany

Filed July 11, 1969, Ser. No. 841,124
Claims priority, application Germany, July 11, 1968, P 17 71 793.0
Int. Cl. B32b *27/06*; B44c *1/22*
U.S. Cl. 117—106 R 12 Claims

A synthetic polymer substrate is provided with a hard, abrasion-resistant surface free of fine hairline cracks by

vapor depositing under vacuum for degassing, onto the surface a B_2O_3-SiO_2 glass containing less than 5 percent by weight of Na_2O. The deposited glass coating has a temperature coefficient of expansion which more nearly corresponds to that of the substrate than does SiO_2.

3,645,780

IMPROVING SOIL RESISTANCE THROUGH THE USE OF RARE EARTH METAL CONTAINING COMPOUNDS

Julian J. Hirshfeld, and Bertie J. Reuben, both of Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 8, 1966, Ser. No. 570,777
Int. Cl. D06m *11/04*
U.S. Cl. 117—138.8 F 14 Claims

A process of improving the soil resistance of polyamide, acrylic, and polyester fiber through impregnating the fiber with an aqueous solution containing a rare earth metal halide, drying the impregnated fiber, and impregnating the dried fiber with a reagent to form a substantially aqueous insoluble rare earth metal compound.

3,645,781

TREATMENT OF KERATINOUS FIBERS AND FABRICS

Thomas D. Brown, Keighley; Michael Rushforth, Brighouse; Bryan Dobinson, Duxford; Walter Wilson, Cambridge, and Kenneth Winterbottom, Whittlesford, all of England, assignors to I.W.S. Nominee Company Limited, London, England and Ciba-Geigy AG, Basel, Switzerland

Filed July 14, 1969, Ser. No. 841,557
Claims priority, application Great Britain, July 15, 1968, 33,687/68
Int. Cl. D06m *15/16*
U.S. Cl. 117—141 27 Claims

The present invention relates to a process for rendering keratinous material, particularly wool, resistant to shrinkage and for imparting durable press characteristics to the material. The products used therefor are polythiol compounds containing in the molecule (a) a radical of a polyhydric alcohol, (b) poly(oxyalkylene) chains, and (c) radicals of mercaptoethers or mercapto-esters.

3,645,782

COVERED WELDING ELECTRODE

Edwin W. Johnson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1969, Ser. No. 805,233
Int. Cl. B23k *35/00*; C23d *3/00*
U.S. Cl. 117—205 7 Claims

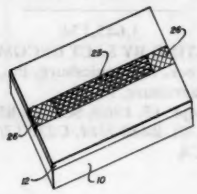
A covered welding electrode for making fully austenitic steel welds characterized by high strength, good ductility, and acceptable impact resistance at all temperatures from near to absolute zero up to at least 900° F. The electrode comprises a fully austenitic steel core wire enclosed by a coating comprising a particular mixture of nonmetallic and metallic ingredients. The nonmetallic ingredients include an alkaline-earth carbonate, at least one oxide of the group consisting of Al_2O_3 and Cr_2O_3, at least one fluoride of the group consisting of CaF_2 and cryolite, a silicate binder, at least one substance of the group consisting of TiO_2 and the titanates of sodium, potassium, and calcium. In addition, at least one of the group consisting of SiO_2, feldspar, calcium silicate may be added as an optional ingredient. The metallic ingredients include at least one metal powder selected from the group consisting of Fe, Ni, Cr, Mn, and master base alloys of Mo, V, Al, and B.

3,645,783

THIN FILM PLANAR RESISTOR

Robert E. Rupert, San Francisco, Calif., and Norman C. Anderson, Wellesley Hills, Mass., assignors to Infrared Industries, Inc., Santa Barbara, Calif.

Filed June 3, 1970, Ser. No. 42,921
Int. Cl. H01c *7/00*
U.S. Cl. 117—212 2 Claims



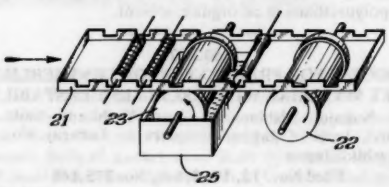
A planar film circuit in which a metallic oxide planar film is on a dielectric substrate, said planar film having areas of insulation comprising said metallic oxide, and areas of conduction comprising reduced metal. The planar film surface is not altered by the presence of said insulating and conducting areas. The method for forming said metallic oxide planar film circuits provides depositing said metallic oxide by reactive sputtering of a metal under vacuum in the presence of oxygen, and selectively reducing areas of said metallic oxide with hydrogren and an energy source. The method is used to obtain planar film electrical circuits having resistor and capacitor elements.

3,645,784

VITREOUS ENAMEL RESISTOR

Walter Helgeland, Nashua; James B. Lazott, Bedford; Philip J. Duke, New Boston; William J. Taggart, Nashua, all of N.H.; George W. Heacox, Pepperell, Mass., and Abe Brandsma, Nashua, N.H., assignors to Sprague Electric Company, North Adams, Mass.

Filed Dec. 18, 1969, Ser. No. 886,240
Int. Cl. B44d *1/14*, *1/02*
U.S. Cl. 117—215 2 Claims



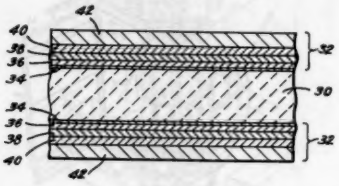
Fused vitreous enamel wire-wound resistor formed by roll coating the surface of the wire and core with a fluid vehicle containing a fused ground vitreous enamel frit dispersed

therein, and then heat treating so as to drive off the vehicle and remelt the fused enamel frit.

3,645,785
OHMIC CONTACT SYSTEM

Hanspeter P. K. Hentzschel, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1969, Ser. No. 875,883
Int. Cl. B44d *1/18*
U.S. Cl. 117—217 16 Claims

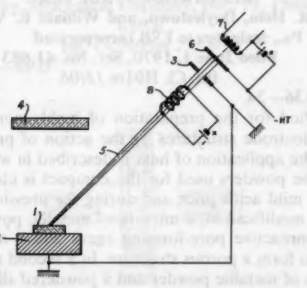


An ohmic contact system for a ceramic body having a predetermined relationship between various physical characteristics, such as temperature and resistance, for example, a wafer of semiconducting barium titanate having a positive temperature coefficient of resistance. A film of germanium is deposited on at least one surface of the wafer to protect the surface properties thereof. A layer of a preselected metal which adheres well to germanium and is readily bondable, such as gold, is deposited on the germanium film. A layer of a preselected barrier layer, such as nickel, which functions to prevent the penetration of subsequently applied process materials, such as solder, which might adversely affect the underlying gold layer, is deposited on the gold layer. An exterior layer of a readily solderable material which adheres well to the underlying nickel layer, such as gold, is deposited on the nickel layer. An external electrical conductor may then be readily soldered to the external gold layer to provide a good ohmic and mechanical contact to the wafer. An additional base layer of a preselected material, such as palladium, which adheres well to nickel and to gold may be deposited intermediate the nickel layer and the exterior gold layer to provide an improved base for the external gold layer.

3,645,786
METHOD FOR DEPOSITING ON A SUPPORT A THIN LAYER OF A SOLID CERAMIC ELECTROLYTE FOR A FUEL CELL

Helmut Tannenberger, 4, Avenue Jules Crosnier, and Pierre Lanaspeze, 20 rue des Caroubiers, both of Geneva, Switzerland

Filed July 18, 1968, Ser. No. 745,726
Claims priority, application Switzerland, July 19, 1967, 10255/67
Int. Cl. C23c *13/04*
U.S. Cl. 117—221 15 Claims

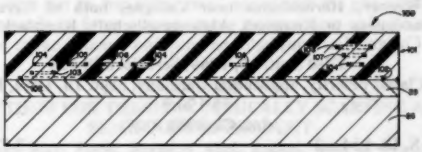


A process has been provided for preparing thin solid electrolyte layer suitable for use in fuel cells. This process comprises the following steps: making electrically conductive at least one substance intended to form the electrolyte layer; maintaining said substance placed on at least one conductor in an enclosure under a vacuum, said support being connected to at least one anode of at least one electron beam accelerating anode and being at the same potential thereof; bombarding said substance by at least one focused electron beam; increasing the energy of said beam to bring gradually the substance being bombarded to a temperature close to the melting point of the substance; and maintaining this temperature, for a sufficient time to obtain by progressive evaporation, a layer of electrolyte of a desired thickness deposited on a support placed within the enclosure.

3,645,787
METHOD OF FORMING MULTIPLE LAYER STRUCTURES INCLUDING MAGNETIC DOMAINS

Jack E. Mee; David M. Heinz; Thomas N. Hamilton; Paul J. Besser, and George R. Pulliam, all of Orange County, Calif., assignors to North American Rockwell Corporation

Filed Jan. 6, 1970, Ser. No. 989
Int. Cl. H01f *10/06*
U.S. Cl. 117—239 6 Claims



A composite consisting of multiple layer structures, the basic structure of which is a chemically vapor deposited film on a substrate wafer, disclosed herein. The film is of such material appropriate for creating therein single wall magnetic domains which are capable of being moved about in predetermined directions within the thickness of the film and in the plane of the film. Devices are adapted to the film for sensing the motion of these domains thereby enabling application of these structures toward circuits which may be particularly utilized in memory or logic applications. A complete family of film on substrate materials are fabricated through a unique process, one of the steps of the process relates to establishment of the exact location of the substrate within the reactor at which deposition of the film upon the substrate is to be made in order to obtain the desired film characteristics. Included, are provisions for making multiple film layers to result in a matrix of films and hence a multitude of such circuits.

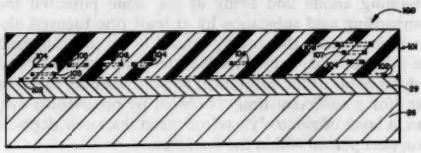
3,645,788
METHOD OF FORMING MULTIPLE-LAYER STRUCTURES INCLUDING MAGNETIC DOMAINS

Jack E. Mee; David M. Heinz; Thomas N. Hamilton; Paul J. Besser, and George R. Pulliam, all of Orange County, Calif., assignors to North American Rockwell Corporation

Filed Mar. 4, 1970, Ser. No. 16,446
Int. Cl. H01f *10/06*
U.S. Cl. 117—239 7 Claims

A composite consisting of multiple-layer structures, the basic structure of which is a chemically vapor-deposited film on a substrate wafer, disclosed herein. The film is of such material appropriate for creating therein single-wall magnetic domains which are capable of being moved about in predetermined directions within the thickness of the film and in the plane of the film. Devices are adapted to the film for sensing the motion of these domains thereby enabling application of these structures toward circuits which may be particularly utilized in memory or logic applications. A complete family of film on substrate materials are fabricated through a

unique process, one of the steps of the process relates to establishment of the exact location of the substrate within the reactor at which deposition of the film upon the substrate is to be made in order to obtain the desired film characteristics.



Included are provisions for making multiple film layers to result in a matrix of films and hence a multitude of such circuits. Films used are comprised of at least three and four elements.

3,645,789

CLEANSING PROCESS

Dietrich Mandelkow, Knapsack near Cologne, and Hugo Werner, Hermulheim near Cologne, both of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Filed Sept. 15, 1969, Ser. No. 858,155

Claims priority, application Germany, Sept. 18, 1969, P 17 96 190.9

Int. Cl. B08b *3/08*

U.S. Cl. 134—2 **7 Claims**

Process for cleansing soiled apparatus parts, especially the pipe systems and vapor sides of surface condensers. The soilings include yellow phosphorus, red phosphorus, phosphorus sludge or mixtures thereof, which may be further contaminated with arsenic, antimony and/or compounds thereof. The cleansing operation is carried out using an aqueous solution of sodium peroxide or of a mixture of sodium carbonate and hydrogen peroxide.

3,645,790

COMPOSITION AND PROCESS FOR CLEANING METAL

Peter Burden, Stoke Poges, and Colin Alfred Whitton, Ashford, both of England, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Feb. 13, 1970, Ser. No. 11,331

Claims priority, application Great Britain, Feb. 17, 1969, 8,489/69

Int. Cl. C23g *1/06, 1/12*

U.S. Cl. 134—3 **6 Claims**

A composition for cleaning aluminum and aluminum alloy surfaces which comprises from about 1 to 30 percent by weight phosphoric acid and from about 0.15 to 15 percent by weight nitric acid, the weight ratio of nitric acid to phosphoric acid being about 0.02–0.6:1. This solution further contains from about 0.05 to 20 percent by weight of a nonionic surface active agent, which is stable in the nitric acid containing solution. This cleaning composition is particularly adapted for use in the spray cleaning of aluminum alloy surfaces which contain 2 percent or more of alloy elements, such as magnesium.

3,645,791

METHOD FOR WASHING INDUSTRIAL ARTICLES

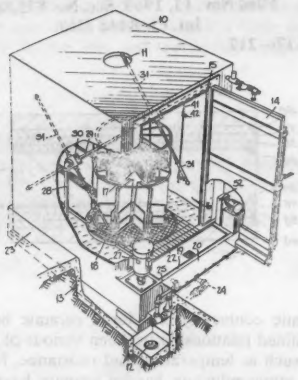
Howard M. Sadwith, Colts Neck, N.J., assignor to Industrial Washing Machine Corporation, Matawan, N.J.

Original application Oct. 30, 1967, Ser. No. 679,097, now Patent No. 3,517,675, dated June 16, 1970. Divided and this application Dec. 4, 1969, Ser. No. 879,969

Int. Cl. B67c *1/00;* **B08b** *3/02*

U.S. Cl. 134—25 A **4 Claims**

The method of washing industrial articles, involving the steps of placing the articles to be washed on a platform rotating at a predetermined speed in an enclosure; directing a series of streams of water on said articles, said streams of water issuing from nozzles on a rotating spray head, whereby through the rotation of the articles and the rotation source of



the streams of water, variation in the incident angles of the streams of water impinging on the articles is greatly increased to produce a scrubbing, scouring, or lifting effect on dirt and foreign matter present on the articles being washed.

3,645,792

ELECTRICAL ENERGY STORAGE DEVICE UTILIZING CURRENT COLLECTOR HAVING ANISOTROPIC ELECTRICL PROPERTIES

Thomas H. Hacha, Willoughby, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 20, 1969, Ser. No. 808,877

Int. Cl. H01m *35/00*

U.S. Cl. 136—6 **1 Claim**

An electrical energy storage device is provided which has a pair of spaced aluminum-lithium alloy anodes with an active carbon cathode interposed therebetween and the anodes and cathodes are separated by an inert spacer material containing a fused salt electrolyte.

This device is assembled by enclosing the cathode in a fiber mat, which functions as the spacer, positioning the cathode in a screen basket, closing the basket to contain the cathode, inserting the screen basket into a container, positioning an anode within the container on each side of the screen basket, and hermetically sealing said container.

3,645,793

METHOD FOR PRODUCING POROUS METAL BATTERY ELECTRODE STRUCTURE

Edward R. Hein, Doylestown, and William E. Veit, Ivyland, both of Pa., assignors to ESB Incorporated

Filed June 1, 1970, Ser. No. 41,883

Int. Cl. H01m *13/08*

U.S. Cl. 136—24 **7 Claims**

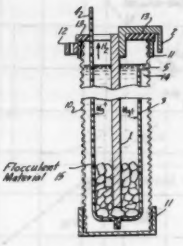
A method for the preparation of highly porous metallic battery electrode structures by the action of pressure alone without the application of heat is described in which the surface of the powders used for the compact is cleaned by the action of mild acids prior and during the pressing operation. In a first modification, a mixture of metallic powder, a powdered nonreactive pore-forming agent and a mild acid are pressed to form a porous structure. In a second modification, a mixture of metallic powder and a powdered slightly soluble mild acid are pressed to form a porous structure. In the two modifications the pore former is removed after the pressing operation.

3,645,794

DISPOSABLE ANODE PACKAGE

Robert P. Hamlen, Scotia, and Erwin G. Siwek, Ballston Spa, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 19, 1970, Ser. No. 12,645
Int. Cl. H01m 29/04
U.S. Cl. 136—86 A 4 Claims



The disclosure describes a disposable anode package for use in mechanically rechargeable oxygen-depolarized metal-air batteries. The anode package includes a cellophane envelope which retains the flocculent discharged anode material. A pull tab at the top of the cellophane envelope allows the spent anode to be removed. Dependent on the thickness of the individual cells, nonreactive mesh or fiber separator materials are used to prevent the discharged flocculent matter from dropping to the bottom of the anode package.

3,645,795

ELECTROCHEMICAL CELLS

William E. Elliott, Elmgrove, and James R. Huff, Milwaukee, both of Wis., assignors to Globe Union Inc., Milwaukee, Wis.

Filed Dec. 7, 1966, Ser. No. 599,759
Int. Cl. H01m 27/00
U.S. Cl. 136—86 A 10 Claims

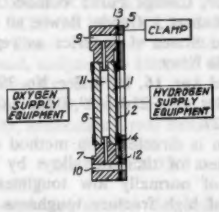
Electrochemical primary and secondary cells which utilize alkali or alkaline earth metal anodes such as lithium, potassium, sodium, calcium and magnesium, and catalytic air electrodes which utilize components of the atmosphere, namely, oxygen and water as a source of electrochemical power. The electrolyte system in the electrochemical cells comprises a nonaqueous electrolyte solvent, namely, an organic solvent of sufficient polarity to dissolve an electrolyte salt.

3,645,796

ELECTROCHEMICAL CELL CONTAINING ELECTRICAL CONTACT AND METHOD OF USING

Harald Bohm, Oberursel, and Joachim Heffler, Grossauheim, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Dec. 18, 1969, Ser. No. 886,154
Claims priority, application Germany, Dec. 19, 1968, P 18 15 690.6
Int. Cl. H01m 27/00
U.S. Cl. 136—86 D 9 Claims



To prevent corrosion at the contact to a gas-diffusion electrode of an electrolytic cell, the electrode is provided on its gas-side with a hydrophobic porous coating of, for example, polytetrafluoroethylene and with a layer of graphite, tungsten carbide, or niobium silicide in conductive contact with the electrode.

3,645,797

METAL PHOSPHATIZING COMPOSITION AND PROCESS

Guy Lorin, Epinay sur Seine, France, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,994
Claims priority, application France, Dec. 24, 1968, 180365
Int. Cl. C23f 7/10
U.S. Cl. 148—6.15 R 2 Claims

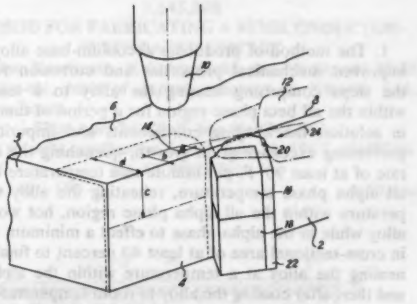
In a phosphating process in which the metal surface is treated with a solution of phosphoric acid, a dibasic phosphate and an accelerator which is a nitrated aromatic derivative having at least one free phenol radical, the nitrated organic derivative is dissolved in a nonionic surfactant which is the reaction product of ethylene oxide and a hydrophobic base, before being combined with the phosphoric acid and dibasic phosphate to form the phosphating solution. In this manner, a more homogeneous composition is obtained than has heretofore been possible when the nitrated organic derivative per se, has either been mixed with the phosphated compounds to form a concentrate composition or has been added to the aqueous phosphating solution.

3,645,798

METHOD FOR THERMOCHEMICALLY SCARFING A SEMIFINISHED PRODUCT

Jacques Birr, Paris; Bernard Abel, Epinal, both of France, and Patrice Charbonnier, Pointe Noire, Congo, assignors to L'Air Liquide Societe Anonyme pour l'etude et l'exploitation des procedes Georges Claude

Filed July 29, 1969, Ser. No. 845,757
Claims priority, application France, Aug. 2, 1968, 161766
Int. Cl. B23k 7/06
U.S. Cl. 148—9.5 6 Claims



Method for thermochemically scarfing a semifinished product having a horizontal face and a vertical face.

A scarfing torch scarfs simultaneously contiguous strips of both faces. A row of burners heats the upper portion of the vertical face. In case this face is too broad, a supplementary row of smaller scarfing torches scarfs the lower portion.

3,645,799

METHOD OF ACTIVATING NICKEL-BASED CATALYSTS

Bernard Goue, Gif-sur-Yvette; Louis Guitard, Paris, and Claude Edon, Fontenay-aux-Roses, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed May 29, 1968, Ser. No. 733,076
Claims priority, application France, May 29, 1967, 108159
Int. Cl. C21d 1/00; C22f 1/10
U.S. Cl. 148—2 15 Claims

A method for activating nickel-based catalysts and the products resulting therefrom, which comprises annealing and

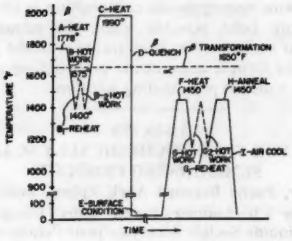
hardening a nickel-based alloy prior to mechanical shaping, mechanically shaping said alloy, annealing and hardening said alloy a second time, isothermally annealing said alloy and thereafter cooling said alloy to about room temperature.

3,645,800

METHOD FOR PRODUCING WROUGHT ZIRCONIUM ALLOYS

James W. Mock, Franklin Township, Export, and William C. Bowen, McKeesport, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1965, Ser. No. 515,297
Int. Cl. C21d
U.S. Cl. 148—11.5 **7 Claims**



1. The method of producing zirconium-base alloys having improved mechanical properties and corrosion resistance, the steps comprising heating the alloy to a temperature within the all beta phase region for a period of time to place in solution the alloying components and impurities while preventing excessive grain growth, quenching the alloy at a rate of at least 90° F. per minute to a temperature below the all alpha phase temperature, reheating the alloy to a temperature within the all alpha phase region, hot working the alloy while in the alpha phase to effect a minimum reduction in cross-sectional area of at least 40 percent to final size, annealing the alloy at a temperature within the alpha phase, and thereafter cooling the alloy to room temperature.

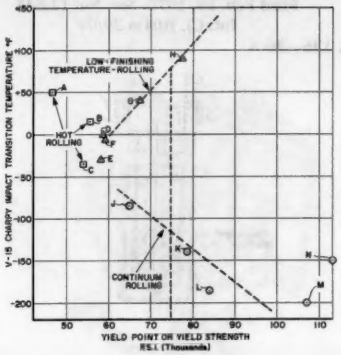
3,645,801

METHOD OF PRODUCING ROLLED STEEL HAVING HIGH STRENGTH AND LOW IMPACT TRANSITION TEMPERATURE

George F. Melloy, and Joseph D. Dennison, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Continuation-in-part of application Ser. No. 741,372, June 27, 1968, now abandoned. This application Dec. 20, 1968, Ser. No. 786,844
Int. Cl. C21d *7/14, 9/46*
U.S. Cl. 148—12 **4 Claims**

Rolled steels characterized in their as-rolled condition by an unexpected combination of high-strength and low-impact transition temperature. The product is produced by rolling a steel workpiece containing both austenite and ferrite, preventing complete recrystallization at any time thereafter, and continuing the rolling of said workpiece as it is cooling in



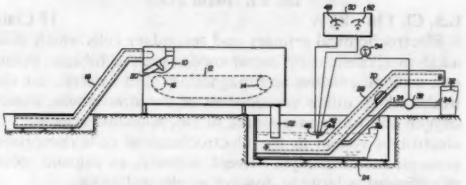
the temperature range between the Ar_1 temperature and 600° F.

3,645,802

METHOD OF MAINTAINING CONSTANT WATER VOLUME IN A MOLTEN SALT SOLUTION

William R. Keough, Bloomfield Hills, Mich., assignor to Multifastener Company, Detroit, Mich., a part interest

Filed Oct. 27, 1969, Ser. No. 869,568
Int. Cl. C21d *1/46, 1/60*
U.S. Cl. 148—15 **2 Claims**



A method of maintaining the percentage of water in a molten salt solution substantially constant. The method includes the step adding water to a body of molten salt in response to a rise in the electrical resistivity of the solution beyond a certain predetermined value, and continuing the addition until the electrical resistivity falls back to the predetermined value.

3,645,803

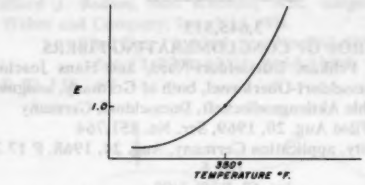
METHOD FOR IMPROVING THE FRACTURE TOUGHNESS OF METALS AND ALLOYS

Ralph W. Huber, College Park; William S. Pellini, Forest Heights, and Robert J. Goode, Bowie, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 16, 1970, Ser. No. 29,193
Int. Cl. C21d *1/00;* **B23p** *3/09*
U.S. Cl. 148—127 **3 Claims**

This invention is directed to a method of improving the fracture toughness of titanium alloys by bonding a high-strength alloy of normally low toughness onto a lower strength alloy of high fracture toughness with subsequent heat treatment of the combination if desired or required.

3,645,804
THERMAL TREATING CONTROL
Basil M. Ponchel, Mentor-On-The-Lake, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Jan. 10, 1969, Ser. No. 790,366
Int. Cl. C21d 1/00; G06g 7/24
U.S. Cl. 148—128 8 Claims



A method for imparting to a metal or other body the predetermined effects of a specific thermal exposure at a preselected temperature T′, but where the actual temperature of the body varies during the treatment from the desired temperature T′, is provided by maintaining the treatment until the cumulative thermal effects reach a predetermined value. Also contemplated is an arrangement for measuring cumulative time and temperature effects during a thermal treatment wherein means are employed to provide a signal output which represents the thermal effect function based on the temperature which signal is fed to a means accumulating that signal and providing an additional signal upon reaching a predetermined accumulation.

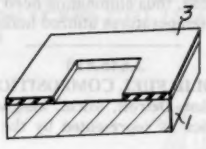
3,645,805
PRODUCTION OF PATENTED STEEL WIRE
Bernd Hoffmann, Dusseldorf; Georg Bollig, Buderich, and Otto Dopper, Krefeld, all of Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany
Original application May 3, 1967, Ser. No. 635,776. Divided and this application Nov. 10, 1969, Ser. No. 871,313
Claims priority, application Germany, May 7, 1966, 38955
Int. Cl. C21d 9/52
U.S. Cl. 148—156 11 Claims

A method for producing patented steel wire by depositing the wire in nonconcentric overlapping turns on a moving conveyor belt and controlling its temperature to convert its texture to ferrite and pearlite.

3,645,806
COATING SOLUTIONS DERIVED FROM PEROXY DISULFURIC ACID OR PEROXY DIPHOSPHORIC ACID
Richard Elliott Shaw, Windsor, and Michael Ware, Penn, both of England, assignors to Imperial Chemical Industries Limited, London, England
Filed Aug. 8, 1969, Ser. No. 848,699
Claims priority, application Great Britain, Aug. 16, 1968, 39,268/68
Int. Cl. C23f 7/08
U.S. Cl. 148—6.15 Z 8 Claims

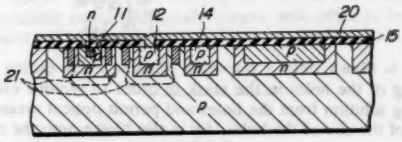
An acidic phosphating solution for coating metal surfaces comprising (1) zinc phosphate (2) an acid radical derived from peroxy disulphuric acid, peroxy diphosphoric acid, peroxy diboric acid or peroxy dicarbonic acid and (3) a conventional phosphating accelerator.

3,645,807
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE
Minoru Ono, Kodaira-shi, and Toshimitu Momoi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 21, 1967, Ser. No. 692,547
Claims priority, application Japan, Dec. 26, 1966, 41/84435
Int. Cl. H01l 7/50, 7/44
U.S. Cl. 148—187 7 Claims



A method for forming a silicon nitride film on the surface of a semiconductor substrate in the following way. A silicon oxide film is formed on a prescribed portion of the surface of the semiconductor substrate. A silicon nitride film is deposited to cover the surfaces of the silicon oxide film and of the semiconductor substrate. At least one portion of the silicon nitride film deposited on the silicon oxide film is removed. The silicon oxide film in this portion is removed from the surface of the semiconductor substrate. Thus, a silicon nitride film having a prescribed pattern is formed on the surface of the semiconductor substrate.

3,645,808
METHOD FOR FABRICATING A SEMICONDUCTOR-INTEGRATED CIRCUIT
Takamitsu Kamiyama, Kokubunji-shi, and Michiyoshi Maki, Kodaira-shi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 24, 1968, Ser. No. 747,361
Claims priority, application Japan, July 31, 1967, 42/48796
Int. Cl. H01l 7/34
U.S. Cl. 148—187 8 Claims



A method for selectively diffusing gold into a silicon substrate, wherein a plurality of circuit elements spaced from each other are formed on a surface portion of the substrate and a gold layer, not covering the PN-junction exposed at the surface thereof, is deposited on the surface of a specific circuit element which is desired to have a high-switching speed and then said gold is subjected to thermal treatment so that said deposited gold may be diffused into said specific circuit element.

3,645,809

AQUEOUS SLURRY EXPLOSIVES HAVING IMPROVED OXIDIZER-FUEL SYSTEM AND METHOD OF MAKING

Frederic S. Stow, Jr., Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 9, 1969, Ser. No. 883,625
Int. Cl. C06b *15/00*
U.S. Cl. 149—38 23 Claims

Aqueous slurry-type inorganic oxidizer salt explosive containing a defined nitrate salt fuel-oxidizer system imparting unpredicted low-aqueous aqueous solution precipitation temperatures, which, in turn, provide for improved sensitivity, detonation rate, available energy and fluid properties at temperatures as low as −60° C. and lower.

Method for manufacture of the explosives under ambient temperature conditions utilizing two separate solutions each having a crystallization temperature below the ambient temperature, is provided, thus eliminating need for elevated mixing, and solution, temperatures utilized heretofore.

3,645,810

SOLID FUEL COMPOSITION

Seymour A. Genden, Detroit, Mich., assignor to The United States of America as represented by the Secretary of the Army

Filed June 14, 1955, Ser. No. 515,564
Int. Cl. C06d *5/06*
U.S. Cl. 149—43 4 Claims

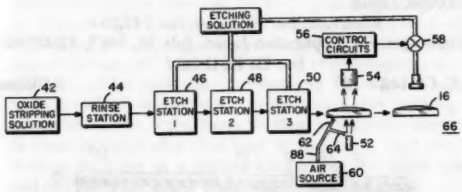
1. A solid fuel comprising a composition consisting of about 80 to 95 percent by weight of magnesium powder: 2 to 10 percent by weight of sodium nitrate; 2 to 10 percent by weight of a synthetic rubber cement; 6 to 8 percent by weight of stearic acid, and compressed into a solid having a specific gravity of from 1.30 to 1.70.

3,645,811

METHOD AND APPARATUS FOR CONTROLLING THE SIZE OF PERFORATIONS IN A SHADOW MASK

John G. Davies, and John C. Thomas, both of St. Paul, Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed Mar. 2, 1970, Ser. No. 15,366
Int. Cl. C23f *1/02*; B23p *15/00*
U.S. Cl. 156—5 10 Claims



Air is blown onto a television shadow mask during the etching of the holes in the mask in order to remove excess etching solution from the holes and permit optical measurement of the size of the holes. Air is also blown onto the optical measurement apparatus for the same purpose.

3,645,812

METHOD OF PURIFYING A QUARTZ PROCESSING VESSEL FOR USE IN THE PRODUCTION OF SEMICONDUCTORS

Erhard Sussmann, Poing, Germany, assignor to Siemens Aktiengesellschaft, Munchen, Germany

Filed Sept. 10, 1968, Ser. No. 758,708
Claims priority, application Germany, May 3, 1968, P 17 71 305.2
Int. Cl. H01l *7/50*, *7/44*
U.S. Cl. 156—17 6 Claims

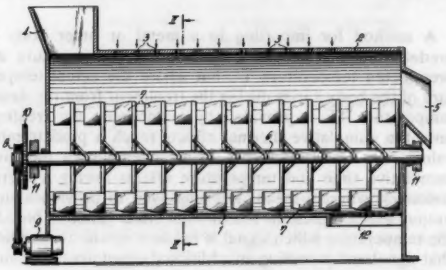
Described is a method of purifying a quartz processing vessel used in the production of semiconductors and more particularly for epitaxy from the gaseous phase. According to the invention, the entire inside surface of the processing vessel is provided with a highly pure silicon layer by precipitation from the gaseous phase. The silicon layer and its quartz base are thereafter tempered at a temperature of at least 1,000° C. The silicon layer is then selectively removed from its quartz base and the processing vessel is then ready for use as intended.

3,645,813

METHOD OF CONGLOMERATING FIBERS

Hans Dieter Pelikan, Duesseldorf-Nord, and Hans Joachim Funke, Duesseldorf-Oberkassel, both of Germany, assignors to Feldmuhle Aktiengesellschaft, Duesseldorf, Germany

Filed Aug. 20, 1969, Ser. No. 851,764
Claims priority, application Germany, Aug. 24, 1968, P 17 28 102.6
Int. Cl. B29j *5/00*
U.S. Cl. 156—62.4 9 Claims



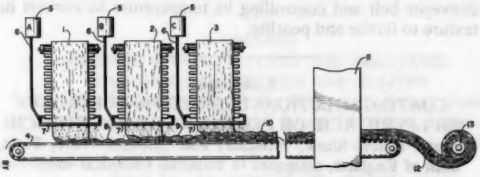
Lignocellulose fibers obtained from wood in a defibrator form conglomerates when held in a state of high turbulence while suspended in air. Globular conglomerates having diameters of 2 to 30 mm., relatively dense outer shells and loose cores are produced continuously in a turbulence zone in dwell times of a few minutes.

3,645,814

PROCESS FOR PRODUCING RESIN TREATED COTTON BATTING PRODUCTS WHEREIN THE DENSITY OF PORTIONS OF THE PRODUCT CAN BE VARIED TO MEET END USE REQUIREMENTS

Nestor B. Knoepfler, New Orleans, and Paul A. Koenig, Kenner, both of La., assignors to The United States of America as represented by the Secretary of Agriculture

Continuation-in-part of application Ser. No. 728,162, May 10, 1968, now abandoned. This application Oct. 10, 1969, Ser. No. 865,323
Int. Cl. B32b *17/05*
U.S. Cl. 156—62.8 1 Claim



Variations in density, flame retardancy, resiliency, dimensional stability, coherence, integrity, and moldability are imparted to fibrous cellulosic batting upon treatment wherein the batting is impregnated with aqueous mixtures containing certain combinations of thermoplastic and thermosetting

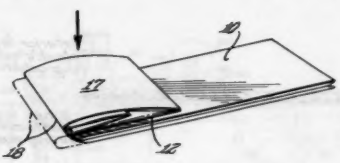
resins selected for their compatibility with each other and with such additives as urea phosphate complexes, borated urea-formaldehyde, diammonium phosphate, or boron containing organic or inorganic salts, by changes in the relative ratio of thermoplastic to thermosetting resin components.

3,645,815

METHOD OF CLOSING BOTTOM FLAPS OF PAPER BAGS

Clifford J. Bedore, New Holstein, Wis., assignor to H. G. Weber and Company, Inc., Kiel, Wis.

Filed Dec. 12, 1969, Ser. No. 884,483
Int. Cl. B31b *49/04*; B65d *33/00*
U.S. Cl. 156—69 **6 Claims**



A method of securing the trailing bottom flaps of paper bags into place on the bag bottoms after the leading flaps have been secured, the method comprising thrusting the trailing flap flatwise against the body of the bag and then folding the bottom backwardly onto the trailing flap and pressing the same thereagainst until preapplied adhesive has set.

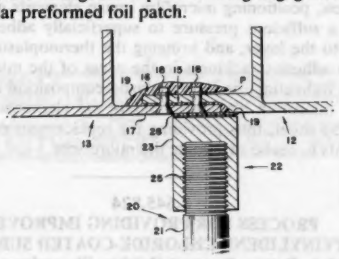
3,645,816

METHOD FOR SEALING LEAKS IN FLUID TANKS

Michael G. Billias, Decatur, and Robert L. Floyd, Jr., Norcross, both of Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed July 14, 1969, Ser. No. 841,389
Int. Cl. B32b *35/00*
U.S. Cl. 156—94 **10 Claims**

A method and apparatus for effecting permanent external repairs of fluid leaks generally around fasteners in a rigid hollow articles such as aircraft integral fuel tank leaks by placing over the leaking fastener a metallic foil preformed patch having the same configuration as the protruding portion of the fastener and coated with a polysulfide sealant, or other types of rapid cure sealants, and then curing the sealant preferably by the application of heat to the localized area by a heating tool having interchangeable tips for mating engagement with the particular preformed foil patch.



3,645,817

BONDING WITH AN ELECTRICALLY HEATED, NONCURING SEALANT TAPE

John Walker, Sarnia, Ontario, and Ronald H. McEuan, Cooksville, Ontario, both of Canada, assignors to Polymer Corporation Limited, Sarnia, Ontario, Canada

Continuation-in-part of application Ser. No. 760,686, Sept. 18, 1968, now abandoned. This application Nov. 24, 1969, Ser. No. 879,591
Claims priority, application Canada, Oct. 3, 1967, 1,516
Int. Cl. C09j *3/14*; B29c *27/06*; E06b *7/23*
U.S. Cl. 156—108 **6 Claims**

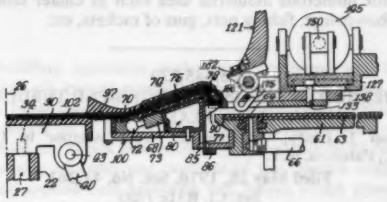
Thermosensitive compositions are provided comprising an elastomeric polymer, a compatible polymer which may be a resinous polymer (such as an ethylene/vinyl acetate copolymer) or a flexible thermoplastic polymer (such as a multiblock copolymer), finely divided metal particles and optionally filler and plasticizer materials. The compositions are suitable for use in sealant tapes which comprise an electrically conducting core embedded in a matrix of the compositions. Electric current may then be passed through the core to soften the matrix for installation onto bondable surfaces.

3,645,818

TIRE BUILDING METHOD

Larry C. Frazier, Sun City, Ariz., assignor to National Standard Company, Niles, Mich.

Original application Dec. 2, 1968, Ser. No. 780,435, now Patent No. 3,582,435, dated June 1, 1971. Divided and this application Sept. 21, 1970, Ser. No. 73,781
Int. Cl. B29h *17/22, 17/26*
U.S. Cl. 156—128 **2 Claims**



Method of building pneumatic tires in which tire carcass material is initially formed into a tubular cylinder after which radially outwardly extending tire bead shoulders are formed inwardly of the ends of the tubular cylinder and into engagement with tire beads supported concentrically outwardly of the displaced material forming the tire bead shoulders, initially supporting the tire bead shoulders in engagement with the tire beads, displacing the outer ends of the tubular cylinder axially inwardly to encase the tire beads while the latter are initially supported in engagement with the tire bead shoulders, thereafter, secondarily supporting the encased tire beads and releasing the initial supporting of the tire beads followed by radially displacing the intermediate portion of the tubular cylinder and moving the encased tire beads while secondarily supported axially toward each other to form the tubular cylinder into substantially torous configuration.

3,645,819

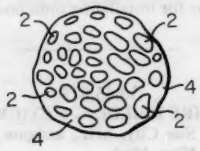
METHOD FOR MANUFACTURING SYNTHETIC MULTICORE ELEMENTS

Shigeru Fujii; Takashi Miwa; Kazushige Noji; Chikatsu Okagawa, all of Nagoya-shi, and Masamichi Toki, Otsu-shi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 13, 1968, Ser. No. 712,778
Claims priority, application Japan, Mar. 16, 1967, 44/21483; May 11, 1967, 42/38736; Aug. 16, 1967, 42/52169; Oct. 26, 1967, 42/68553; Oct. 21, 1967, 42/88955; Nov. 11, 1967, 42/72363
Int. Cl. B29b *17/32*
U.S. Cl. 156—148 **12 Claims**

A method for manufacturing improved synthetic bonded filament yarn by forming a unit composite from matrix and

island components, assembling a plurality of the unit composites into a randomly bundled multifilament yarn and heating the multifilament yarn at a temperature between the melting points of both components. The cross section of the unit composite can be obtained in any of so-called sheath-core configuration, randomly distributed configuration and



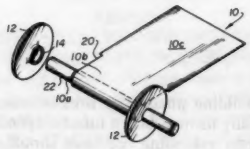
bimetallike configuration of the components. The bonded filament yarn has excellent flexibility and a unique surface condition having many wrinkles thereon and the bonded filament yarn of the present invention can be advantageously used for numerous industrial uses such as chafer fabrics of tires, bowstrings, fishing nets, guts of rackets, etc.

3,645,820

METHOD OF MAKING FLANGED-END TUBULAR ELEMENTS OF PLASTIC MATERIAL

Michael J. Clary, Canadaigua, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Filed May 28, 1970, Ser. No. 41,261
Int. Cl. B31c *1/00*
U.S. Cl. 156—191 **3 Claims**



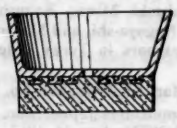
A flared-in central opening portion of an otherwise flat, plastic, flange element is disposed between and in overlapping relationship with edge portions of cylindrically wound plastic tape, whereafter, the overlapping portions of the tape and flange element are fused to unify them. The wound tape may have a thus associated flange element at either or both ends thereof.

3,645,821

METHOD FOR CONNECTING FOAMED MATERIALS TO THERMOPLASTIC BODIES

Manfred Baumann, Heerbrugg, and Alois Stahli, Diepoldsau, both of Switzerland, assignors to Baumann AG, Diepoldsau, Switzerland

Filed June 3, 1969, Ser. No. 830,044
Int. Cl. B32b *3/06*
U.S. Cl. 156—196 **7 Claims**



There is disclosed a method for connecting a thermoplastic handle, grip or container with a sponge or foamed material. This method enables a sponge to be adequately secured to the thermoplastic member. Articles produced according to this invention are advantageously used in the application and spreading of a detergent composition (in liquid or paste form) upon a surface.

3,645,822

METHOD FOR PROVIDING MULTILAYER FILMS HAVING IMPROVED SLIP PROPERTIES

Almar T. Widiger, and Drew H. Moore, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 31, 1969, Ser. No. 795,452
Int. Cl. B29c *19/00*; B32b *27/08*; C09j *00/00*
U.S. Cl. 156—243 **11 Claims**

Slip properties of multilayer films of thermoplastic organic polymers are improved by incorporating small amounts of a conventional slip additive, e.g., oleamide, into one or more of the inner layers of said films. Said films exhibit slip characteristics which are retained for relatively long periods of time.

3,645,823

PROCESS FOR FORMING A MICROFICHE

Fritz Merk, Wiesbaden; Gerhard Debus, Assmannshausen, and Herbert Ewald Muller, Wiesbaden, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Nov. 24, 1969, Ser. No. 879,017
Claims priority, application Germany, Nov. 27, 1968, P 18 11 212.4
Int. Cl. B32b *7/06*
U.S. Cl. 156—247 **6 Claims**

A microfiche is formed by coating a transparent support sheet with a layer of transparent potentially adhesive thermoplastic composition exhibiting low adhesive tackiness at ambient conditions, but which is heat-activatable to adhesive tackiness, positioning microfilm image elements on the layer under a sufficient pressure to superficially adhere the elements to the layer, and bringing the thermoplastic composition to adhesive tackiness in the areas of the microfilm elements. Reheating the thermoplastic composition in the areas of the microfilm elements renders the elements removable from the sheet, thus providing for replacement of microfilm elements to revise or update the microfiche.

3,645,824

PROCESS FOR PROVIDING IMPROVED POLYVINYLIDENE CHLORIDE-COATED SUBSTRATES

Richard A. Patton, Prospect Heights, Ill., assignor to Morton International, Inc.

Filed Oct. 29, 1968, Ser. No. 771,618
Int. Cl. C09j *5/00*
U.S. Cl. 156—322 **1 Claim**

A method of retaining adhesion, reducing blocking, and increasing the solvent resistance of polyvinylidene chloride-coated substrates comprising coating a substrate with a solution or aqueous dispersion of a polyvinylidene chloride composition, removing the volatile matter therefrom, heating the coated substrate to a temperature of from about 100° to about 200° F., and maintaining the temperature of said coated substrate for a period of time ranging from about at

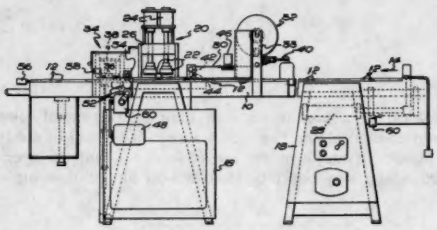
least 20 hours for a temperature of about 100° F. to at least about 2 minutes for a temperature of about 200° F.

3,645,825

APPARATUS FOR SEALING THIN WALLED CONTAINERS

Thomas Norman Gaunt, Leeds, and Edward Dodsworth, Pudsey, both of England, assignors to Plastona (John Waddington) Limited, Leeds, England

Filed May 19, 1969, Ser. No. 825,756
Claims priority, application Great Britain, May 21, 1968, 24,083/68; 24,084/68; Feb. 1, 1969, 5,543/68
Int. Cl. B29c 27/02; B65b 7/00
U.S. Cl. 156—361 **7 Claims**



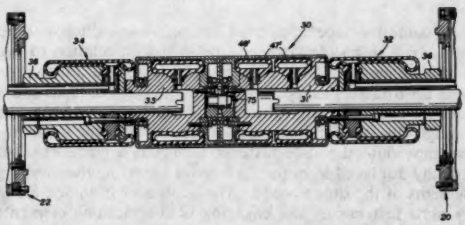
Apparatus for sealing molded thin wall thermoplastic containers with lidding from a roll of lidding material wherein the containers move on platens in queues in groups of four containers on each platen past a sealing head and the lidding material is adhered about the top peripheral flange of the container, while the containers almost touch, the movement of the queue unrolling the roll of lidding material, and thereafter severing the lidding material between adjacent containers in the queue. The lids may be printed.

3,645,826

TIRE BUILDING DRUM

Virgil E. Henley, Akron, and Walter W. Lauer, Jr., Canton, both of Ohio, assignors to The General Tire & Rubber Company

Filed Feb. 6, 1970, Ser. No. 9,711
Int. Cl. B29h 17/16, 17/22
U.S. Cl. 156—401 **10 Claims**



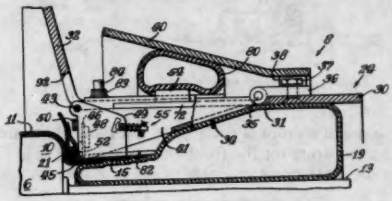
A tire-building machine is a structural combination of two relatively independent sections. Each section comprises a support housing, a rotatable shaft cantilevered from the housing and a cylindrical drum mounted at the free end of the shaft for rotation therewith. With the axes of the shafts aligned, the drums thereon are connectable at their outer axial ends to form a divisible tire-building drum of predetermined axial length or "set." An annular ply turnup bladder is mounted for rotation with each shaft adjacent the inner axial end of each drum. Also, an annular bead ring carrier is mounted on each housing to reciprocate coaxially of each shaft. The set of the divisible drum can be adjusted by replacing one or both of the constituent drums with other drums of different lengths.

3,645,827

APPARATUS FOR INCORPORATING TIRE BEADS INTO A TIRE

Larry C. Frazier, Sun City, Ariz., assignor to National-Standard Company, Niles, Mich.

Filed Feb. 19, 1970, Ser. No. 12,774
Int. Cl. B29h 17/22
U.S. Cl. 156—401 **12 Claims**



Tire-building apparatus embodying combined tire bead holder and ply turnup means having bead placer means embodying bead finger frame means carrying bead-supporting fingers which in a one position of the bead finger frame means hold tire beads concentrically against tire bead shoulders inwardly of outer end portions of tire carcass material supported around first inflatable bag means which provides for displacing the bead finger frame means to another position freeing the bead supporting finger means from the beads while the bead placer means hold the beads against the tire bead shoulders, in which the bead placer means is moved outwardly by further expansion of the first inflatable bag means and the tire beads are further encased in the outer end portions of the tire carcass material, and in which the tire bead holder and ply turnup means are then moved axially to effect displacement of the outer end portions of the tire carcass material on the inflatable bag means to fully encase the beads in the outer end portions of the tire carcass material. The apparatus, as noted, embodying second inflatable bag means operative in association with the first bag means to permit upon inflation of the first inflatable bag means movement of the bead finger from the bead, and the apparatus as first noted in which the tire bead holder and ply turnup means embody sidewall pusher means for applying sidewall components to the tire carcass material after the latter is formed into a substantially torous configuration.

Method of building a tire in which tire carcass material is formed with tire bead shoulders from which outer end portions of tire carcass material extend, supporting tire beads concentrically at the tire bead shoulders, freeing the support of the tire beads while maintaining the tire beads against the tire bead shoulders and partially encase the tire beads in the outer end portion of the tire carcass material, and then displacing the outer end portions of the tire carcass material over the tire beads and onto the tire carcass material at the tire beads to fully encase the tire beads.

3,645,828

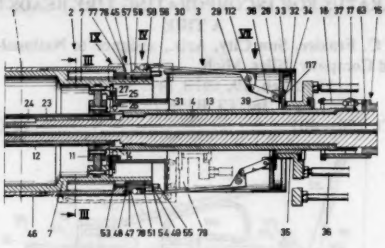
TIRE BUILDING-UP DRUM

Walter Balle, Dornigheim, and Gerhard Held, Hochstadt, both of Germany, assignors to Leonhard Herbert Maschinenfabrik

Filed Mar. 4, 1970, Ser. No. 16,285
Claims priority, application Germany, Aug. 21, 1969, P 19 42 579.7
Int. Cl. B29h 17/14
U.S. Cl. 156—402 **20 Claims**

A tire-constructing machine having a case-making drum adjustable as to its diameter with annular grooves at the axial

ends thereof to receive bead rings of the tire. Wrapping means are provided at both ends of the drum with wrapping fingers and exchangeable segments of various length so that



the case-making drum is variable in itself and stops are provided on the drum for the front ends of the wrapping fingers to limit the retracting movement of the wrapping fingers.

3,645,829

APPARATUS FOR PRODUCING A FIBER REINFORCED COMPOSITE MATERIAL

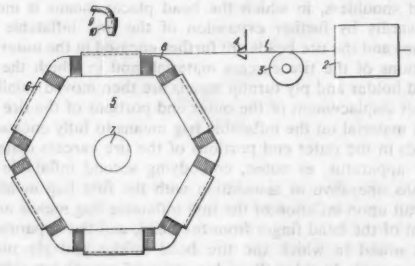
Jack Palfreyman, Tansley, near Matlock, and Henry Edward Middleton, Derby, both of England, assignors to Rolls-Royce Limited, Derby, England

Filed Nov. 15, 1968, Ser. No. 776,115

Claims priority, application Great Britain, Dec. 5, 1967, 55,170/67

Int. Cl. B65h *31/08*

U.S. Cl. 156—441 **1 Claim**



The present invention relates to apparatus for producing a carbon or boron fiber reinforced composite material for use in the manufacture of blades for gas turbine engines. The apparatus consists of a number of aerofoil section formers mounted on a rotatable drum means for winding a continuous fiber or bundle of fibers under tension onto the formers, a source of curable matrix material located adjacent the drum, and means for curing the matrix material.

3,645,830

APPARATUS FOR FORMING PLASTIC LOUVER SCREEN

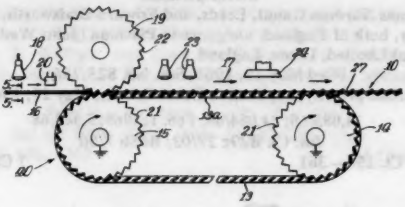
Harold Warp, Chicago, Ill., assignor to Flex-O-Glass, Inc.

Original application Aug. 14, 1967, Ser. No. 660,478, now abandoned. Divided and this application Oct. 13, 1969, Ser. No. 871,436

Int. Cl. B32b *31/18*

U.S. Cl. 156—510 **15 Claims**

Apparatus for forming a plastic louver screen from a flat sheet of plastic material, said screen having a plurality of cut louvers twisted from the flat configuration of the sheet and permanently set without residual stress in the twisted configuration. The disclosed apparatus for forming the plastic louver screen includes a forming support member, means for softening the plastic sheet and cutting the plastic sheet to conform to the forming support member, thereby to provide in the sheet a louver screen configuration. The forming support member may comprise a plurality of block members having upper surfaces defining the metal louver screen con-



figuration or a continuous belt defining the metal louver screen configuration. The louver screen is formed of a settable plastic. In one form, the louver screen includes a layer of metal which may be embedded therein or define a surface thereof.

3,645,831

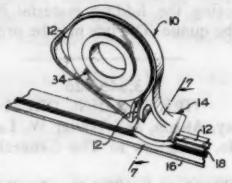
SLIDE FASTENER ADHESIVE TAPE APPLICATOR

Bruce K. Thaeler, Meadville, Pa., assignor to Textron Inc.

Filed Jan. 21, 1970, Ser. No. 4,650

Int. Cl. B32b *31/04*

U.S. Cl. 156—527 **1 Claim**



An adhesive tape applicator for applying adhesive tape from a roll to a slide fastener tape in spaced relation to the meshing elements of the slide fastener including a compartment for rotatably supporting the roll of adhesive tape, and a pressure foot-receiving adhesive tape from the compartment through a passage and having a surface for pressing the adhesive tape onto the slide fastener tape and a guide channel laterally displaced from the surface for receiving the meshing elements of the slide fastener. The applicator is guided along the slide fastener by the engaging of the meshing elements with the guide channel to apply the adhesive tape to the slide fastener tape in spaced relation with the meshing elements.

3,645,832

PNEUMATIC LABEL APPLICATION SYSTEM

Anton Sauer, Baldwin Park, Calif., assignor to Avery Products Corporation, Marino, Calif.

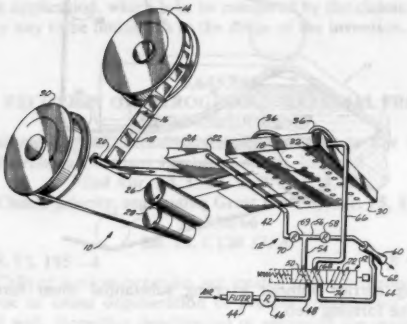
Filed Feb. 2, 1970, Ser. No. 7,793

Int. Cl. B32b *31/04, 31/10*

U.S. Cl. 156—541 **12 Claims**

A venturi provided with a steady or intermittent high-pressure flow of a gaseous medium, such as air, creates a suction potential at a perforated surface to attract and register a

pressure-sensitive label dispensed from a carrier web. The label is subsequently transferred onto a substrate by a reverse



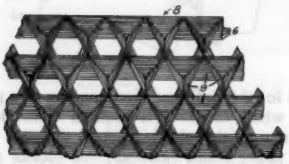
high-pressure flow of the gaseous medium through the perforated surface in the direction of the substrate.

3,645,833

ARTICLE AND METHOD OF QUASI-ISOTROPIC CORE FILAMENTS

Irving E. Figge, Newport News, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed May 20, 1970, Ser. No. 39,597
Int. Cl. B32b 5/12
U.S. Cl. 161—57 10 Claims



A quasi-isotropic sandwich-type structural core filament winding made by a jig on which the fiber filaments are interwoven in a manner where each fiber lays on top of the preceding fiber so that when the winding is completed, a core is produced which consists of a series of tetrahedrons, half of which point upwards and half point downwards. The completed winding is then coated with an epoxy resin and cured, when removed from the jig. The jig may be of varied shapes so that the core is flat, cylindrical, air foil or other irregular shapes.

3,645,834

REINFORCED FLUOROCARBON POLYAMIDE CONTAINERS

Lee A. McCaffrey, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 24, 1969, Ser. No. 809,997
Int. Cl. B32b 15/08, 27/12
U.S. Cl. 161—92 5 Claims

This invention relates to the method of making a container, said container comprising forming a laminate comprising a polyamide fabric having a coating of a fluorocarbon composition thereon and a film of either a polyimide or a fluorocarbon adhered to the fluorocarbon composition coating, said film containing a metallic deposit of a reflective nature on its outer surface.

3,645,835

MOISTURE-VAPOR-PERMEABLE PRESSURE-SENSITIVE ADHESIVE MATERIALS

Martin E. Hodgson, Harlow, England, assignor to T. J. Smith & Nephew Limited, Kingston-upon-Hull, England

Filed July 7, 1969, Ser. No. 839,436
Claims priority, application Great Britain, July 9, 1968, 32,588/68; Oct. 22, 1968, 50,045/68; Dec. 20, 1968, 60,756/68
Int. Cl. C09j 7/02; A61f 13/00; A45d 31/00
U.S. Cl. 161—146 26 Claims

This invention relates to a moisture-vapor-permeable pressure-sensitive adhesive material for use on animal skin and nails, e.g. a surgical drape, suture strip or sheet, adhesive dressing, bandage, plaster, strapping tape, decorative nail covering, or decorative cosmetic product. The adhesive material comprises a backing material, and a pressure-sensitive adhesive on at least substantially the whole of the body adhering portion of at least one surface of said backing material, both said backing material and said adhesive being moisture-vapor-permeable and unaffected by water and at least one of said backing material and said adhesive comprising a synthetic polymer and being continuous and nonpermeable to liquid water, said adhesive material having a moisture vapor permeability of at least 300 g./sq. meter/24 hours/40° C./80 percent RH.

3,645,836

WATER-ABSORPTION FIBROUS MATERIALS AND METHOD OF MAKING THE SAME

David Torr, 150 East 56th Street, New York, N.Y.

Filed Sept. 5, 1968, Ser. No. 757,760. The portion of the term of the patent subsequent to Oct. 17, 1984, has been disclaimed.
Int. Cl. A61f 13/18; B32b 5/22
U.S. Cl. 161—151 12 Claims

A readily disposable water absorbent product, such as a diaper, bed napkin or catamenial device, and process of making the same, the product comprising a supporting sheet of cellulose fiber and a layer of dry, flexible fibers which on contact with 20 times their weight of water at 25° C. lose their fibrous character and form a soft plastic gel, said flexible fibers consisting essentially of a polysaccharide gum or starch and the weight ratio of said cellulose fibers to said gel-forming fibers being in the range of 20:1 to 1:1.

3,645,837

LAMINATES

Douglas S. Chisholm, Midland, and Walter J. Schrenk, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original application Dec. 29, 1967, Ser. No. 694,470, now Patent No. 3,357,265, dated Jan. 19, 1971, which is a continuation-in-part of application Ser. No. 402,118, Oct. 7, 1964, now abandoned, which is a continuation-in-part of application Ser. No. 432,258, Feb. 12, 1965, now abandoned. Divided and this application Aug. 14, 1970, Ser. No. 63,839
Int. Cl. B32b 3/26, 7/00, 27/08
U.S. Cl. 161—160 5 Claims

Plastic film or sheet having a plurality of layers is formed by deforming a flowing stream having layers of diverse thermoplastic material to provide a sheet or film having a laminar structure. Alternating foamed and unfoamed layers are obtained.

3,645,838

RIGID MULTILAYER FORMED SHEET STRUCTURES

Ritchey O. Newman, Jr., Midland, and Walter J. Schrenk, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1970, Ser. No. 8,058
Int. Cl. B32b 00/00, 25/12, 27/08
U.S. Cl. 161—164 5 Claims

This invention provides economical multilayer sheets that combine high-barrier layers with layers of rigid polyvinyl chloride or impact polystyrene.

3,645,839

GLASS SEALING COMPOSITIONS CONTAINING ALUMINUM TITANATE

Frank Veres, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Continuation-in-part of application Ser. No. 790,465, Jan. 10, 1969, now abandoned. This application Sept. 23, 1969, Ser. No. 860,433

Int. Cl. B32b *17/06*; C03c *3/04*

U.S. Cl. 161—193 11 Claims

A crystallizable fusion-type glass sealing composition, such as lead borosilicate or lead-zinc-borate solder glass, having incorporated therein from about 1 to about 25 percent by weight of aluminum titanate; which solder glass is useful in sealing TV bulbs, in electronics sealing applications and in other instances where the sealing of a glass surface to another surface, such as glass, can be accomplished at a temperature sufficiently low as not to damage any sensitive or delicate electronic parts closely spaced from the surfaces being sealed.

3,645,840

METHOD FOR PEROXIDE BLEACHING OF PULP

Robert M. Lincoln, Moylan, and Joseph A. Meyers, III, Springfield, both of Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Continuation-in-part of application Ser. No. 781,989, Dec. 6, 1968, now abandoned. This application Jan. 19, 1971, Ser. No. 107,843

Int. Cl. D21c *3/00*

U.S. Cl. 162—78 4 Claims

Bleaching of ligneous cellulosic materials such as paper pulp by treating the pulp with a combination of tertiary butyl hydroperoxide and hydrogen peroxide as the bleaching agent.

3,645,841

WATER-SOLUBLE QUATERNIZED MELAMINE-ALDEHYDE RESINS AND THEIR APPLICATION IN THE PAPER INDUSTRY

Jean-Antoine Cabestany, Stains, and Yves Lefebvre, Montmorency, both of France, assignors to Nobel Hoechst Chimie, Puteaux de Seine, France

Filed Dec. 29, 1969, Ser. No. 888,933

Claims priority, application France, Dec. 30, 1968, 181890

Int. Cl. D21d *3/00*

U.S. Cl. 162—166 11 Claims

A water-soluble resin is prepared by condensing 1 to 6 moles of an aldehyde compound such as glyoxal with 1 mole of melamine and reacting the resulting product with 0.2 to 0.5 moles of a quaternization agent such as dimethyl sulfate per mole of said melamine.

3,645,842

DUAL FABRIC APPARATUS FOR PAPER WEB FORMATION

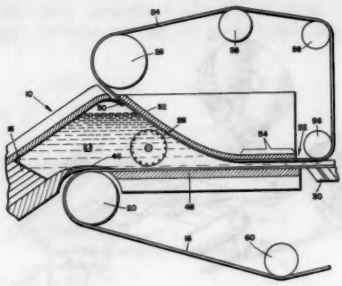
George T. Ward, Greenwich, Conn., assignor to International Paper Company, New York, N.Y.

Filed Feb. 3, 1969, Ser. No. 796,131

Int. Cl. D21f *11/04*

U.S. Cl. 162—303 5 Claims

To form a web of papermaking fibers in the process of papermaking, a suspension of such fibers is passed from a head box between a pair of endless fabrics, at least one of which is a foraminous forming carrier. The fabrics are moved over paths formed by head box walls which have respective facing surfaces which are substantially impervious and which are substantially parallel over a substantial distance to and including the outlet orifice of the head box and are spaced a predetermined distance apart. Prior to any substantial formation of a web, the suspension leaves the orifice entrained between the fabrics and moves at the same speed and in the same direction. Thereafter a web of the papermaking fibers is formed by removing water from the suspension through the



forming carrier without exerting substantial shear forces upon the forming web.

3,645,843

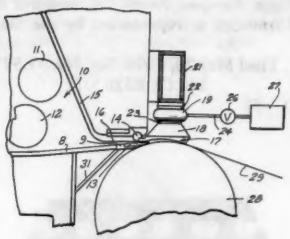
FLUID CONTROL OF HEADBOX SLICE OPENING

John F. Schmaeng, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 30, 1970, Ser. No. 33,247

Int. Cl. D21f *1/06*

U.S. Cl. 162—347 8 Claims



A control for the headbox slice opening of a papermaking machine in which the slice is position controlled by pneumatic means, such that the load upon the slice lips is transferred to a heavy frame member. Air blocks are mounted between the slice lip and the heavy frame member to allow precise position control of the slice lips.

3,645,844

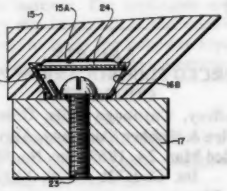
MOUNTING MEANS FOR FOIL TYPE AND SIMILAR ELEMENTS

John E. Grenier, Cherry Valley, Mass., assignor to Lodding Engineering Corporation, Auburn, Mass.

Filed Apr. 22, 1968, Ser. No. 722,960

Int. Cl. D21f *1/48*

U.S. Cl. 162—352 4 Claims



The disclosure describes a support for a stationary drainage element for a paper machine extending across the Fourdrinier wire. The support comprises a flaring tenon for a dovetail slide incorporating means to adjust the distance between the flaring walls. The drainage element has a mor-

tise slot for cooperating with the slide. The flare of the slide is adjusted by means of an actuator mounted at one end of the support.

This abstract is intended neither to define the invention of the application, which is to be measured by the claims, nor in any way to be limiting as to the scope of the invention.

3,645,845

RECOVERY OF NITROGENOUS MATERIAL FROM MICRO-ORGANISMS

Philippe Corteel, Versailles, France, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 13, 1967, Ser. No. 630,510
Claims priority, application Great Britain, Apr. 15, 1966, 16,536/66
Int. Cl. C12d *13/06*
U.S. Cl. 195—4 **9 Claims**

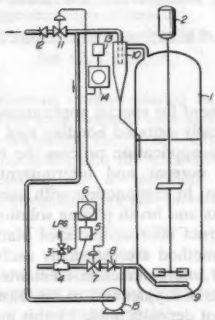
Cells of a micro-organism are treated with a proteolytic enzyme to cause degeneration of protein components of the cell wall, thereafter deactivating or removing the proteolytic enzyme and continuing enzymatic attack on the cell wall with a carbohydratase (whereby attack on the protein of the cytoplasm is avoided or reduced) thereafter recovering an aqueous fraction containing nitrogeneous material.

3,645,846

PROCESS AND APPARATUS FOR ADDING A LIQUEFIED HYDROCARBON GAS TO A CULTURE MEDIUM

Osamu Imada, Machida-shi; Kazuo Hoshia, Tokyo, both of Japan, and Masatami Tanaka, deceased, late of Machida-shi, Japan (by Itsuko Tanaka, administratrix), assignors to Kyowa Hakko Kogyo Co., Ltd., Chiyoda-ku, Tokyo, Japan

Continuation of application Ser. No. 696,957, Jan. 10, 1968, now abandoned. This application June 24, 1968, Ser. No. 740,448
Int. Cl. C12d *13/06*; C12b *1/00*
U.S. Cl. 195—28 R **14 Claims**



A continuous process and apparatus for culturing a micro-organism in an aqueous nutrient medium under aerobic conditions in the presence of a liquefied hydrocarbon gas which comprises adding fresh liquefied hydrocarbon gas to the culture medium, measuring the concentration of the unused liquefied hydrocarbon gas removed from the culture medium, discharging the unused liquefied hydrocarbon gas to the atmosphere until a predetermined concentration of said liquefied hydrocarbon gas is reached, and then recycling the liquefied liquefield hydrocarbon gas while at the same time discontinuing the addition of the fresh liquefied hydrocarbon gas until the concentration of the unused liquefied hydrocarbon gas falls below said process concentration. The rpocess and apparatus of the present disclosure is also applicable to liquefied hydrocarbon gas-air mixtures.

3,645,847

MICROBIOLOGICAL HYDROXYLATION OF AROMATIC ACIDS

Robert W. Eltz, Media, Pa., assignor to Sun Oil Company, Philadephia, Pa.

Filed Feb. 8, 1968, Ser. No. 703,870
Int. Cl. C12b *1/00*
U.S. Cl. 195—30 **5 Claims**

A benzoic acid having from zero to three methyl and/or halo substituents and having at least two adjacent unsubstituted ring carbon atoms can be converted to the corresponding dihydroxybenzoic acid derivative by the action of various species of Nocardia which are normally incapable of performing such a conversion. This is accomplished by first contacting the Nocardia cells with an aromatic or halogenated aromatic hydrocarbon for a time sufficient to induce the enzyme system of said cells to perform such an hydroxylation, and thereafter contacting the induced cells with the benzoic acid substrate under aerobic conditions.

3,645,848

PROCESS OF PREPARING GLUCOSE ISOMERASE

Chin K. Lee; Lawrence E. Hayes, and Margaret E. Long, all of WinstoneSalem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 17, 1969, Ser. No. 877,474
Int. Cl. C12d *13/10*; C13k *9/00*
U.S. Cl. 195—31 R **17 Claims**

Glucose is converted to fructose in the presence of an enzyme preparation derived from a member of the genus *Arthrobacter*.

3,645,849

STABILITY OF ENZYMES

Oscar S. Gray, Fort Lauderdale, Fla., assignor to Gray Industries, Inc., Fort Lauderdale, Fla.

Filed Apr. 17, 1969, Ser. No. 817,181. **The portion of the term of the patent subsequent to Feb. 10, 1987, has been disclaimed.**
Int. Cl. C12k *1/00*; C07g *7/02*
U.S. Cl. 195—62 **20 Claims**

Enzymes in an aqueous medium are cooled to 50° F. or below and then subjected to microwave energy under controlled conditions whereby the stability of the enzymes against deterioration is materially increased.

3,645,850

PREPARATION OF ACID CARBOXYPEPTIDASE

Eiji Ichishima, and Fumihiko Yoshida, both of Noda-shi, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

Filed Apr. 8, 1969, Ser. No. 814,269
Claims priority, application Japan, Dec. 9, 1968, 43/89525
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 R **1 Claim**

A new enzyme, acid carboxypeptidase, whose significant characteristics are to give high activity at the low optimum pH, i.e., pH 1.5 to 5.5, and whose substrate specificity, molecular weight and other properties are entirely different from those of already known carboxypeptidase, is prepared by cultivating organism belonging to Aspergillus to obtain the crude enzyme solution and then purifying the above-obtained enzyme solution by one or more processes which include appropriately selecting and/or combining, of fractional precipitation, solvent precipitation, dialysis, various chromatographies, gel filtration. Said enzyme thereby obtained has the great advantage of enzymatically hydrolyzing protein and peptides within a low pH range where the danger of contamination is minimized.

3,645,851

RECOVERY OF GLUCOSE OXIDASE

Hans Ulrich Bergmeyer, Tutzing; Wolfgang Gruber, Garathshausen; Hans Moellering, and Waldemar Thum, both of Tutzing, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Nov. 14, 1968, Ser. No. 863,374
Claims priority, application Germany, Nov. 20, 1967, P 16 42 592.6
Int. Cl. C07g 7/02
U.S. Cl. 195—66 R 11 Claims

Process for the recovery of glucose oxidase in highly purified form comprising adjusting the pH of an aqueous solution containing impure glucose oxidase to a value of from 6.5 to 7.5, while maintaining the temperature of the solution at from 15° to 25° C., adding methanol up to a concentration of 62 volume percent and separating off the precipitate thereby formed.

3,645,852

METHOD OF BINDING WATER-SOLUBLE PROTEINS AND WATER-SOLUBLE PEPTIDES TO WATER-INSOLUBLE POLYMERS USING CYANOGEN HALIDE

Rolf E. A. V. Axen, Simonsbo, Upplands Balinge; Jerker Olof Porath, Karlsrogatan 42, and Erik Sverker Ernbach, Vaktgatan 8, both of Uppsala, all of Sweden

Continuation-in-part of application Ser. No. 729,914, May 17, 1968, now abandoned. This application Mar. 6, 1970, Ser. No. 17,336
Claims priority, application Sweden, May 23, 1967, 7169/67
Int. Cl. C07g 7/00, 7/02
U.S. Cl. 195—68 8 Claims

Cyanogen halides are employed for binding water-soluble proteins and water-soluble peptides containing a primary or secondary amino group to a water-insoluble polymer containing one or more hydroxyl and/or primary and/or secondary amino groups. The invention is useful, among other things, for binding water-soluble enzymes to water-insoluble polymers while preserving the activity of the enzyme.

3,645,853

DIAGNOSTIC COMPOSITION AND METHOD FOR THE DETECTION OF NITRATE REDUCTION

Donald P. Kronish, Rockaway, and William D. Young, Jr., Montclair, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 24, 1969, Ser. No. 836,089
Int. Cl. C12k 1/06
U.S. Cl. 195—103.5 R 11 Claims

A diagnostic composition and method for detecting the reduction of nitrate to nitrite by micro-organisms which comprises a carrier material impregnated in specific zones with a nitrate-containing medium, a barrier composition, and two stable reagent solutions. In use, a suspension of the culture to be tested is incubated in the presence of the nitrate medium and the reduction of nitrate to nitrite is indicated by the formation of color in the reagent zones.

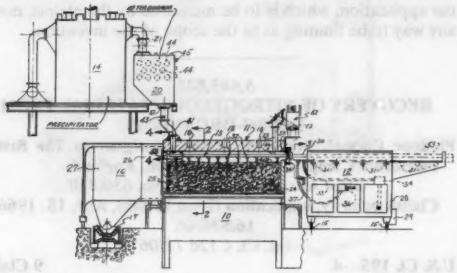
3,645,854

METHOD IN BYPRODUCT COKE OVEN OPERATION AND APPARATUS FOR SAME

Albert Calderon, 7732 Ragall Parkway, Cleveland, Ohio

Filed Feb. 26, 1970, Ser. No. 14,268
Int. Cl. C10b 39/06
U.S. Cl. 201—39 13 Claims

An improved method for byproduct coke oven operation wherein the problems of pollution caused by charging, oxidation of green coke, pushing and quenching are eliminated by the quenching operation taking place within the oven prior to the removal of the doors and pushing of the coke; the combustion gases created by the charging, and the steam and water gases generated by the quenching are extracted and completely burned in an afterburner prior to the gases being dust-cleaned in a precipitator. The coke being quenched in the sealed oven to a temperature lower than the ignition



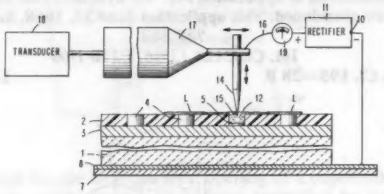
point of the coke eliminates the oxidation thereof after it is pushed from the oven thereby increasing the efficiency of the oven from the standpoint of yield.

3,645,855

ULTRASONIC REPAIR PLATING OF MICROSCOPIC INTERCONNECTIONS

Renee L. Wisman, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1970, Ser. No. 63,878
Int. Cl. C23b 7/00, 5/48; B23p 1/02
U.S. Cl. 204—16 4 Claims



Plating equipment for special applications includes a point tipped ultrasonically agitated bonding tool adapted for electroplating. In the application process the tool receives continuous plating current and intermittent side-to-side ultrasonic agitation. In conjunction with commercial dry film photoresist masks and brush plating solutions the equipment is used to construct microscopic spot plating deposits. The equipment and method are especially useful for customized repair/rework or interconnection elements (vias) in printed circuit devices as a supplement to the basic mass manufacture process. Spot deposits made by this method are formed rapidly, well-adhered and comparable in overall quality to deposits produced on a mass manufacturing scale by conventional immersion plating techniques. Plating current and tool tip diameter critically affect plating quality.

3,645,856

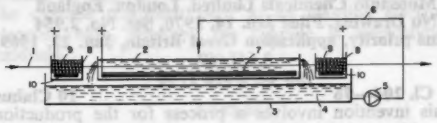
PROCESS AND APPARATUS FOR ELECTROLYTIC TREATMENT OF TRANSPORTED WIRES

Kurt-Jurgen Schulze, Oberbruch, Germany, assignor to Glanzstoff AG, Wuppertal, Germany

Filed Mar. 19, 1970, Ser. No. 20,888
Claims priority, application Germany, Mar. 20, 1969, P 19 14 178.7
Int. Cl. C23b 5/68; B01k 3/00
U.S. Cl. 204—28 5 Claims

Process and apparatus for the electrolytic treatment of wires being transported through an electrolytic bath wherein

the current supply to the wires is improved by conducting the wires in contact with a granular conductor of the first class



arranged in a suitable bed or layer externally of the electrolytic bath.

3,645,857

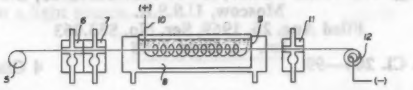
METHOD OF MAKING PLATED WIRE MEMORY ELEMENT

Robert D. Fisher; Ernest W. Jones, both of Woodstock, and Eugene A. Grossi, Saugerties, all of N.Y., assignors to Ferroxcube Corporation, Saugerties, N.Y.

Filed May 28, 1969, Ser. No. 828,674

Int. Cl. C23b *5/32, 5/58, 5/68*

U.S. Cl. 204—28 **2 Claims**



A method of making a plated wire nondestructive readout memory element in which a beryllium copper wire is first copper coated and electrolytically polished to optimize the surface of the copper coating and then continuously electroplated in a nickel sulfamate-ferrous sulfate bath to produce nonmagnetostrictive permalloy coating thereon.

3,645,858

SILVER PLATING BATHS

Wilfred Dingley, Ottawa; John S. Bednar, Gatineau Point, and Raymond R. Rogers, Ottawa, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed July 3, 1969, Ser. No. 839,003

Int. Cl. C23b *5/62*

U.S. Cl. 204—34 **27 Claims**

Novel stable aqueous cyanide-plating baths are provided which include silver ions, sodium ions and cyanide ions, in which the OH^- normality, the "free" CN^- normality, the sodium cyanide normality and the total silver normality are interrelated according to a specified formula. Novel procedures for electroplating are also provided.

3,645,859

DURABLE, ANTICORROSIVE AND ATTRACTIVE SURFACE COATINGS WITH ELECTRICAL CONTACT APPLICATION

Eugene P. Damm, Jr.; Allen W. Grobin, Jr., both of Poughkeepsie; Edwin H. Herel, Fishkill, and David A. Radovsky, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1970, Ser. No. 51,701

Int. Cl. C23f *17/00*

U.S. Cl. 204—35 N **7 Claims**

Electrically functional and decorative surface coatings—which are durable, attractive in appearance and resistant to corrosion and most importantly have long-lasting retention of foregoing properties under service conditions—are produced by reactive absorption of unsaturated oils into oxides of certain metals and metal alloys. The oil-treated oxide surfaces—especially after periods of in-service use—have lower contact impedance, higher conductivity, better retention of appearance and greater resistance to wear and corrosion than the untreated oxides. It appears that a highly stable interfacial compound is formed between the oil, the oxide coating and possibly the unoxidized basic metallic material, which differs considerably from the oxide in stability and general physical composition. Existence of this compound is evidenced by the heightened ability of the treated finish to withstand corrosion and scratching, and the tendency of the finish to actually harden and acquire greater wear resistance and permanence of appearance with age.

3,645,860

PROCESS FOR THE PREPARATION OF AN ELECTROCATALYST

Jerry Haskel Fishman, New York; Jean Francois Henry, Huntington Station, and Susanne Tessore, New York, all of N.Y., assignors to Leesona Corporation, Warwick, R.I.

Filed Mar. 4, 1969, Ser. No. 804,308

Int. Cl. C23b *9/00, 5/24*

U.S. Cl. 204—35 R **13 Claims**

A method for the preparation of an electrocatalyst which comprises (a) electrodepositing less than a complete monomolecular layer of material on a substrate utilizing cathodic polarization of short duration, and (b) oxidizing the electrodeposit and the substrate utilizing anodic polarization, also of short duration is described. The deposited material preferably is a metal or metal oxide having useful catalytic and/or electrical properties, e.g., platinum or gold. The substrate preferably is a metal or metal oxide such as tantalum oxide, tungsten oxide, or a sodium tungsten bronze, Na_xWO_3. The substrate is treated in an electrolyte containing a very dilute solution of the material to be deposited and/or in the presence of a counterelectrode containing this material. Several repetitions of these method steps, i.e., reversing the polarity such that the deposition and oxidation steps alternate, results in the complete or partial integration of minute portions of electrodeposited material in the substrate material. This method is useful for providing or improving catalytic activity in a substrate. The products produced by the method are useful in electrochemical devices.

3,645,861

METHOD OF PLATING ON STAINLESS STEEL

Bruce J. Garvey, Cleveland, Ohio, assignor to Kewanee Oil Company, Bryn Mawr, Pa.

Filed Sept. 8, 1970, Ser. No. 70,559

Int. Cl. C23b *5/08, 5/50*

U.S. Cl. 204—49 **2 Claims**

A process by which a metal may be plated on a stainless steel metal substrate whereby the final electroplated composite possesses greatly improved adherence. Said process involves the electrodeposition of a nickel strike layer on the stainless steel base metal prior to plating a "Woods strike" nickel electroplating bath in which the nickel therein is in the form of nickel bromide and the acid in the bath is hydrobromic acid. The composition and operating conditions of said bath comprise:

$NiBr_2$	100–800 g./l.
HBr	0.2%–20% by weight
Current Density	5–200 a.s.f.
Bath Temperature	60°–115° F.

3,645,862

METHOD OF MAKING AN ELECTRODE

Joseph Bernard Cotton, Little Aston, Sutton Coldfield; William Raymond Bennett, Birmingham; John Alan Bell, Streetly, and Peter Charles Steele Hayfield, Castle Bromwich, all of England, assignors to Imperial Metal Industries Limited, Birmingham, England

Filed Sept. 25, 1968, Ser. No. 762,621

Claims priority, application Great Britain, Sept. 26, 1967, 43,678/67

Int. Cl. C23b *9/00*

U.S. Cl. 204—56 R **5 Claims**

An electrode and method of manufacture thereof in which a film-forming base is provided with an electrically conduc-

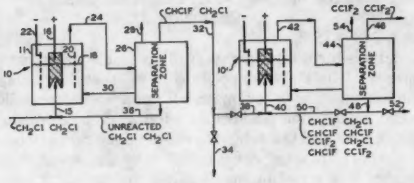
tive coating which comprises a mixture containing at least one chemical compound of the film-forming metal and at least one chemical compound of at least one other metal.

3,645,863

ELECTROCHEMICAL FLUORINATION

William S. Stewart, and John W. Vanderveen, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Oct. 20, 1969, Ser. No. 867,732
Int. Cl. B01k *3/00*
U.S. Cl. 204—59 9 Claims



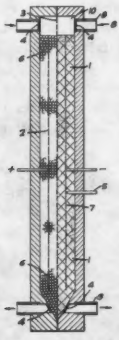
In an electrochemical fluorination process, the residence time or contact time of the feedstock with the fluorinating species within the pores of a porous anode is regulated so as to reduce or eliminate the formation of undesired by-products and increase the production of the desired final product.

3,645,864

PROCESS FOR THE PREPARATION OF A P-AMINO PHENOL BY THE ELECTROLYTIC REDUCTION OF NITROBENZENE

Darryl William Lawson, Wonersh, and David Stanley Salter, Horsham, both of England, assignors to Constructors John Brown Limited, London, England

Filed May 28, 1970, Ser. No. 41,529
Claims priority, application Great Britain, May 28, 1969, 27,058/69
Int. Cl. C07b *29/06*
U.S. Cl. 204—74 9 Claims



A process for the preparation of p-amino phenol and derivatives thereof, which process comprises reducing nitrobenzene electrolytically at a particulate electrode maintained at a cathode potential less negative than −0.40 volts with respect to a saturated calomel electrode, in an acidic medium at a temperature in the range of from 60° to 150° C. Preferably the cathode potential is in the range of from −0.25 to −0.35 volts with respect to a saturated calomel electrode.

3,645,865

PRODUCTION OF SOLS

Terence Gordon Tripp, Chester, England, assignor to Monsanto Chemicals Limited, London, England

No Drawing. Filed Jan. 14, 1970, Ser. No. 2,954
Claims priority, application Great Britain, Jan. 22, 1969, 3,641/69
Int. Cl. B01k *1/00*
U.S. Cl. 204—96 10 Claims

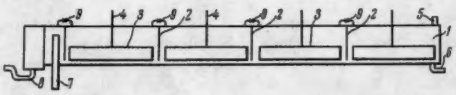
This invention involves a process for the production of a silica sol in which an electric current is passed through a liquid medium comprising a solution in a lower monohydric alcohol of a metal salt that is ionised to a sufficient extent and is present in sufficient amount to function as a supporting electrolyte using an anode comprising silicon in contact with the liquid medium with water being present in an amount of about 10% by weight based on the weight of the lower monohydric alcohol.

3,645,866

METHOD OF ELECTROLYSIS WITH A FLOWING MERCURY CATHODE IN A CHLORINE CELL

Georgy Ivanovich Volkov, Ulitsa Melnikova 23, kv. 11, Moscow, U.S.S.R.

Filed Aug. 26, 1969, Ser. No. 853,063
Int. Cl. C01d *1/08*
U.S. Cl. 204—99 4 Claims



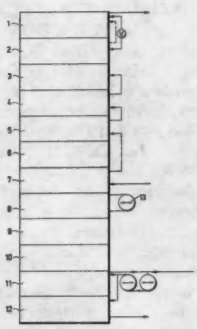
A method of electrolysis with a flowing-mercury cathode in a chlorine cell of the horizontal or slightly inclined type with transverse sectional partitions stopping short of the cell bottom, wherein electrolysis is carried out at pressure varying from section to section, such pressure increasing in the direction opposite to the movement of the mercury and electrolyte.

3,645,867

METHOD OF TREATING CYANIDE-CONTAINING LIQUORS IN SURFACE TREATMENT INSTALLATIONS

Harry A. H. Ericson, Goteborg, and Gustav Bertil Norstedt, Kungsor, Sweden, assignors to Nordnero Aktiengesellschaft, Lucerne, Switzerland

Filed June 19, 1969, Ser. No. 834,787
Claims priority, application Sweden, June 19, 1968, 8,355/68
Int. Cl. B01k *1/00*; B01d *13/00*
U.S. Cl. 204—130 1 Claim



A method of removing cyanide wastes from cyanide-containing surface treating baths in a metal-treating

process which includes an electrolytic alkaline cleaning bath and a cyanide-containing surface treating bath comprising passing the waste cyanide-containing water from the cyanide treatment bath to an alkaline electrolytic cleaning bath, whereby the cyanide is electrolytically oxidized.

3,645,868

METHOD FOR THE PREPARATION OF 1,2-DIBROMO - 2,2-DIHALOETHYL DIALKYL PHOSPHATES

Federico Garcia-Jiménez and Roberto Flores-Segura, Mexico City, Mexico, assignors to Interoceanica S.A., Mexico City, Mexico

No Drawing. Filed June 25, 1970, Ser. No. 49,966

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 HA 13 Claims

Dialkyl-1,2-dibromo - 2,2-haloethyl phosphates, which are insecticides, are prepared by bromination of the corresponding dialkyl-2,2-dihalovinyl phosphates in presence of a free radical type catalyst and under illumination from a light source.

3,645,869

PREPARATION OF A FIBROUS THERMOPLASTIC COPOLYMER OF COTTON AND STYRENE BY RADIATION TREATMENT

Jett C. Arthur, Jr., Metairie, La., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Continuation-in-part of application Ser. No. 320,969, Nov. 1, 1963. This application Jan. 10, 1968, Ser. No. 696,711

Int. Cl. B01j *1/00, 1/12;* C08d *9/06*

U.S. Cl. 204—159.12 3 Claims

This invention relates to the treatment of cotton with styrene monomer dissolved in an essentially anhydrous solvent and then to the radiation copolymerization of the styrene monomer with fibrous cotton cellulose and has as its objects modifications of the physical properties of cotton, particularly imparting thermoplasticity, decreasing stiffness, increasing elongation-at-break, increasing resistance to wetting with water, and changing other related properties of cotton fibers to impart new and desirable properties for use in finished cotton products.

3,645,870

PROCESS FOR PREPARING VINYL CHLORIDE POLYMERS OR COPOLYMERS HAVING BUTADIENE AND ACRYLATE MONOMERS RADIATION GRAFTED THERETO

Norio Sagane, Kyoto-shi, and Hiroshi Harayama and Yotaro Morishima, Osaka-fu, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka-shi, Japan

No Drawing. Filed July 14, 1969, Ser. No. 841,539

Claims priority, application Japan, July 20, 1968, 43/51,488

Int. Cl. C08d *9/08;* C08f *1/16, 29/12*

U.S. Cl. 204—159.17 6 Claims

Process for producing high-impact resins comprising graft polymerizing alkyl acrylate or alkyl methacrylate monomer, butadiene, and vinyl chloride-containing resin powder by impregnating the vinyl chloride resin with the monomer and irradiating the impregnated powder with ionizing radiation while in contact with gaseous butadiene to provide products having superior durability; together with the products obtained thereby.

3,645,871

USE OF BARIUM METABORATE IN ELECTRODEPOSITABLE COMPOSITIONS

Myron J. Krupp, Grafton, Frederick R. Colburn, Franklin, and John P. Knudtson, Milwaukee, Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Aug. 8, 1968, Ser. No. 751,033

Int. Cl. C23b *13/00*

U.S. Cl. 204—181 7 Claims

This invention relates to novel pigmented electrodepositable compositions. More particularly, this invention relates to the use of barium metaborates to reduce stain of resin films electrodeposited on iron containing metal substrates, particularly steel substrates.

3,645,872

PROCESS FOR DEPOSITING ORGANIC COATINGS

Jürgen Weigel, Illingen, Germany, assignor to ECM Gesellschaft fur Elektrochemische Materialbeschichtung mbH & Co. KG, Frankfurt am Main, Germany

No Drawing. Filed Jan. 14, 1969, Ser. No. 791,160

Claims priority, application Germany, Jan. 17, 1968, P 16 46 037.0

Int. Cl. B01k *5/02;* C23b *13/00*

U.S. Cl. 204—181 20 Claims

A process for depositing organic coatings upon metallic or other conductive substrates wherein the organic substance is a dispersion of incompletely, partially or completely polymerized material in an aqueous electrolyte. The substrate is connected as an anode or a cathode in the dispersion and juxtaposed with a counterelectrode. An electrical potential is applied and the conductivity of the dispersion is initially established at 5,000–100,000 μmho-cm.$^{-1}$ at 20° C. The dispersion includes one or more organic substances which deposit upon the substrate under the influence of the electrical potential such that within 25 seconds after the current-density peak develops, the electrical resistance at the deposition-receiving electrode increases to reduce the current density to a level below 20% of the peak thereof. Preferably, the current density is reduced below 20% of its peak level within 10 seconds after the current density peaks.

3,645,873

METHOD OF PRODUCING INSULATED WIRE ASSEMBLIES

Blair E. Cornish, Stone Ridge, and Eugene P. Damm, Jr., and Mark A. Faigenbaum, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

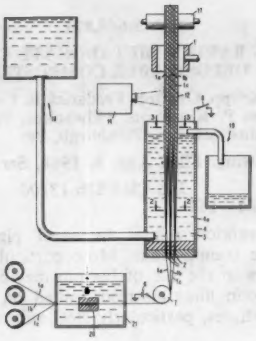
Filed June 30, 1969, Ser. No. 837,568

Int. Cl. B01k *5/02;* C23b *13/00*

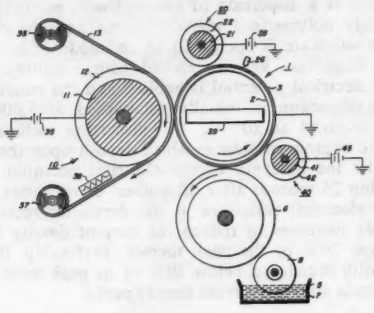
U.S. Cl. 204—181 7 Claims

Insulative film coatings formed upon separated metal wires by electrophoretic deposition from aqueous polymer latex dispersions are found to be conjoinable into supporting structures which are thick by comparison to diameters of enclosed wires and which have pre-determinable dimensional properties when solidified. Electrical signal

transmission lines are made at reduced cost by this process. Wires in such lines are held close together without touching at spacing distances held to tight tolerances. The electrophoretically applied insulating-supporting structure of these lines can be provided with such other desirable features as internal continuity (i.e. crack-free, void-free), thermal stability, abrasion resistance, high dielectric strength, flexibility, and uniform cohesion to the supported wires.



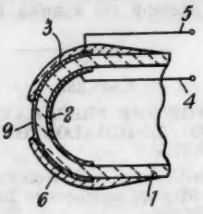
3,645,874
IMAGE DENSITY CONTROL IN PHOTOELECTROPHORETIC IMAGING
John B. Wells, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Oct. 3, 1969, Ser. No. 863,506
Int. Cl. B01k 5/00
U.S. Cl. 204—181 5 Claims



A photoelectrophoretic imaging system is disclosed whereby the density of the image produced at high speeds is increased by the introduction of a "density control" electrode.

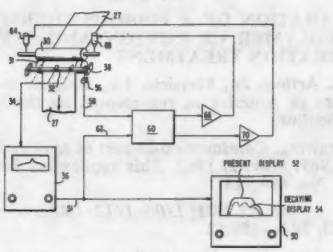
3,645,875
ELECTRODE ASSEMBLY
Robert George Hamilton Record, Haydn Wilson, and Derek Austen Rudd, Luton, England, assignors to George Kent Limited, Luton, England
Filed Nov. 21, 1968, Ser. No. 777,841
Claims priority, application Great Britain, Nov. 23, 1967, 53,424/67
Int. Cl. G01n 27/46
U.S. Cl. 204—195 8 Claims

An electrode assembly, particularly for use at high temperatures, comprises a non-porous refractory base with metal electrode layers, of platinum for example, on opposed sides, at least one of which has a complete or discontinuous refractory overlayer for exposure to hot gases or liquids. The overlayer is porous where the electrode layer is completely encapsulated but need not be where portions, preferably edge portions, are exposed. The base



may be constituted as a tube or as the closed end of a tube. The refractory material may be yttria stabilised thoria or lime stabilised zirconium oxide.

3,645,876
CURRENT TRANSFER MEASUREMENT ALONG A LINEARLY EXTENDED CONTACT
Walter A. Wilson, Pittsburgh, Pa., assignor to National Steel Corporation
Filed July 8, 1969, Ser. No. 839,853
Int. Cl. C23b 5/00, 5/68
U.S. Cl. 204—211 3 Claims



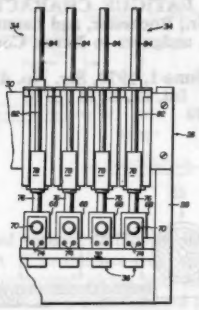
Current transfer along a linearly extended electrical contact is determined during or prior to commencing electroplating or other processing of strip material permitting corrective measures directed toward higher yield and higher quality production. Current distribution is determined by measuring the magnetic flux pattern in the strip material along the linearly extended electrical contact. Automated contact control across the strip is obtained responsive to such measurements.

3,645,877
ELECTROCHEMICAL DEBURRING APPARATUS
David W. Sickels, Plymouth, and Robert E. Sills, Livonia, Mich., assignors to Electrogenics, Inc., Wayne, Mich.
Filed Oct. 13, 1969, Ser. No. 865,874
Int. Cl. B23p 1/04, 1/12
U.S. Cl. 204—224 8 Claims

Electrochemical deburring apparatus for a workpiece including a nonconductive support structure, and a tool electrode mounted on the support structure connected to the negative terminal of a power source. The tool electrode comprises a base, a center shaft extending upwardly from the base, and an outer sleeve extending upwardly from the base concentric with the center shaft and defining a cavity therebetween. The tool electrode has a conduit in the lower portion of it through which electrolyte under pressure is introduced into the cavity. The tool electrode has means for causing turbulent flow of electrolyte while it is in the cavity.

An insulated stop is mounted on the top of the center shaft of the tool electrode and is adapted for cooperating fit within a recess of a workpiece when the workpiece is

seated on the tool electrode, thereby radially aligning the workpiece. The apparatus also has insulated means for clamping the workpiece in position on the tool electrode with the insulated stop in contact with the workpiece, and ears of the workpiece having edges to be deburred projecting into the cavity of the tool electrode between the center shaft and the outer sleeve. The apparatus also

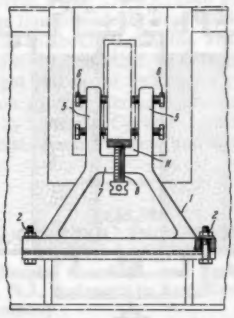


includes means for inserting an electrode connected to the positive terminal of a power source into the workpiece, whereby when electrolyte is passed between the tool electrode and the workpiece and direct current is passed between the workpiece and the tool electrode, the desired areas of the workpiece are deburred. Also disclosed is a method of deburring workpieces.

3,645,878
DEVICE FOR SETTING CATHODES IN ELECTROLYZERS

Evgeny Ivanovich Adaev, 2 Schukinsky proezd 10, korpus 1, kv. 56; Alexandr Vasilievich Blinov, Ulitsa Gorkogo 41, kv. 48; and Georgy Mikirtychevich Kamarian, Vorontsovskaya ulitsa 30 "b," kv. 18; and Viktor Alexandrovich Novoselov, Ulitsa Vavilova 10, korpus 20, kv. 28, all of Moscow, U.S.S.R.

Filed Apr. 23, 1969, Ser. No. 818,634
Int. Cl. C23b *5/70*
U.S. Cl. 204—243 R **2 Claims**

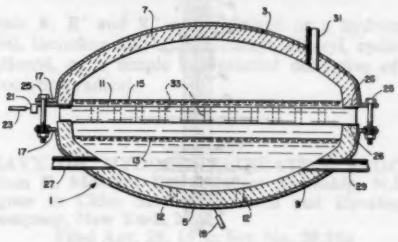


A device for setting the cathodes in electrolyzers made in the form of several diametrically disposed forked members installed at the same level, in which the aperture between the tines of the forked members is used for setting the current-carrying lead of the cathode, in which case each forked member has a means for adjusting the position of the cathode in two mutually perpendicular planes.

3,645,879
CONSTRUCTION OF ELECTROLYTIC CELL

Charles F. Bonilla, Tenafly, N.J., assignor to Barry F. Haskett, Geneva, Switzerland

Filed June 8, 1970, Ser. No. 44,440
Int. Cl. C22d *3/02*; B01k *3/04*
U.S. Cl. 204—247 **14 Claims**

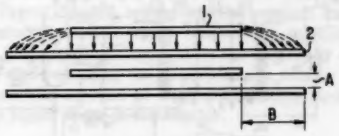


An improved construction for electrolytic cells for the electrolysis of molten sodium chloride and similar salts is provided. The electrolytic cell is characterized in that the anode consists of horizontal slabs of graphite supported by the refractory wall of the bottom half of the cell structure and the anodes are submerged slightly in the electrolyte employed. Such a structure provides a stronger anode, and more rigidly positioned with respect to the bottom of the cell, than if the same were hanging from the top of the cell by stems or necks, as in conventional electrolytic cells.

3,645,880
ELECTRODE APPARATUS FOR BRINE ELECTROLYSIS

Kenji Ueda, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1970, Ser. No. 37,160
Claims priority, application Japan, May 14, 1969, 44/37,256
Int. Cl. B01k *3/04*
U.S. Cl. 204—278 **9 Claims**



An apparatus for electrolyzing brine, or seawater, characterized by a cathode edge projection from the edge of a parallel and opposite insoluble anode which is substantially five times greater than the distance between these electrodes. The apparatus is immersed in a brine conducting passageway and current is applied thereto for permitting electrolysis of the brine during continuous operation thereof, with little or no precipitative deposit on the electrodes, and thereby providing uninterrupted flow of the brine through the passageway and the electrode apparatus for preventing marine growth on parts contacted by the brine.

3,645,881

RIFLE BARREL ELECTROPLATING FIXTURE

Alfred J. Williams, Berkley, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1969, Ser. No. 872,804
Int. Cl. B01k *3/04*; C23b *5/70, 5/56*
U.S. Cl. 204—286 2 Claims

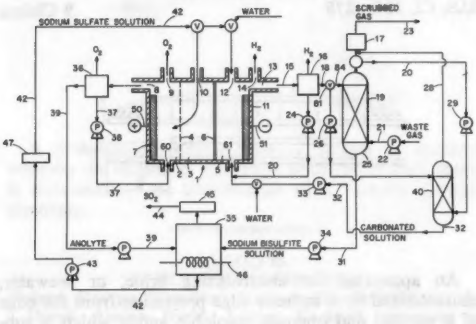
A tool adapted to insure concentricity between an electroplating anode and the bore of a small bore rifle, the tool comprises a chamber-anode-positioner, a muzzle cap, and a muzzle-anode-positioner acting in concert to locate the anode in the center of the bore.

3,645,882

CARBONATION PROCESS FOR SO_2 REMOVAL

Edgardo J. Parsi, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Division of application Ser. No. 795,921, Feb. 3, 1969, now Patent No. 3,515,513, which is a continuation-in-part of application Ser. No. 704,284, Feb. 9, 1968, now Patent No. 3,524,801, which in turn is a continuation-in-part of application Ser. No. 693,903, Dec. 27, 1967, now Patent No. 3,523,880. This application Apr. 1, 1970, Ser. No. 31,459
Int. Cl. B01d *13/02*
U.S. Cl. 204—301 4 Claims



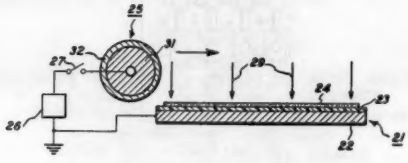
This invention is directed to increasing the current efficiency of the cation exchange membrane located next to the cathode in a three chamber cell for the electrolytic conversion of an alkali metal sulfate for use in the removal and recovery of sulfur dioxide contaminants from flue gases. After the removal of said sulfur dioxide contaminant from flue gas, carbon dioxide is introduced into the cell's catholyte solution by contacting catholyte solution with at least a portion of the said treated flue gas at any point in the catholyte system, preferably by recycling the catholyte solution between the cell's cathode compartment and a carbonation tower.

3,645,883

PHOTOELECTROPHORETIC IMAGING APPARATUS EMPLOYING PHOTOSENSITIVE PARTICLES EXHIBITING FATIGUE CHARACTERISTICS

Ray H. Luebbe, Jr., Rochester, and Leonard M. Carreira, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 1, 1970, Ser. No. 42,409
Int. Cl. B01d *13/02*
U.S. Cl. 204—300 2 Claims



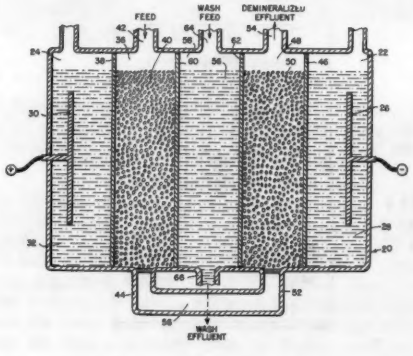
An electrophoretic imaging system comprising exposing a suspension of electrically photosensitive particles in a liquid carrier to imagewise light and, subsequently, developing the image by applying a field across the suspension which causes particle migration in image configuration. The photosensitive particles of this system exhibit fatigue characteristics in that they remain electrically sensitive for a period of time after having been exposed to activating electromagnetic radiation.

3,645,884

ELECTROLYTIC ION EXCHANGE APPARATUS

Edwin R. Gilliland, 95 Longmeadow Road, Belmont, Mass. 02178

Filed July 10, 1969, Ser. No. 840,763
Int. Cl. B01d *13/02*; C02b *1/82*
U.S. Cl. 204—301 5 Claims

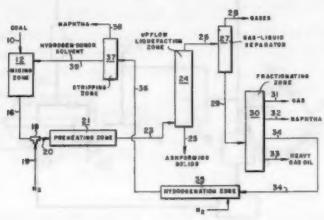


The invention is directed to an ion-selective membrane-electrodialysis apparatus employing a filler of ion-exchange resin in certain chambers of said apparatus for the purpose of deionizing solutions while simultaneously electrolytically regenerating said ion-exchange material.

3,645,885
UPFLOW COAL LIQUEFACTION

Grady W. Harris, Cambridge, Mass., and Frank B. Sprow, Houston, Tex., assignors to Esso Research and Engineering Company

Filed May 4, 1970, Ser. No. 34,224
Int. Cl. C10g 1/04
U.S. Cl. 208—8 12 Claims



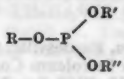
Coal is liquefied without employing internal mixing (by stirrers, etc.) in a turbulence-free upflow liquefaction zone, providing improved yields and selectivity of desirable liquid products than a well-mixed liquefaction zone. Before introduction to the upflow liquefaction zone, a slurry of the coal in a hydrogen-donor solvent is preheated to a temperature within the range from about 700° F. to about 900° F. and subjected to conditions of turbulence, a treatment which causes the coal particles, especially caking-type coal particles, to disintegrate without agglomeration. Introduced into a lower portion of the liquefaction zone, the coal, in mixed solid and liquid phase, is plug flowed upwardly at a superficial liquid velocity sufficient to carry upward all particles which have a maximum settling velocity of from about 0.01 to about 0.04 ft./sec. Particles of higher settling velocities settle through the zone. Continued dissolution of large convertible coal particles decreases their size until they too rise through the liquefaction zone. Settled ash-forming particles are removed from a lower portion of the zone. A liquefaction product is removed from an upper portion of the zone. The liquefaction product contains from about 70 to about 96 weight percent of MEK soluble materials. Solids recovered from a lower portion of the liquefaction zone contain from about 25 weight percent to about 35 weight percent of MEK insolubles and from about 35 to about 45 weight percent of ash. Conditions in the liquefaction zone include a temperature within the range from about 700° F. to about 1000° F., a pressure within the range from about 350 p.s.i.g. to about 3000 p.s.i.g. and an average liquid residence time within the range from about 5 minutes to about 60 minutes. The hydrogen-donor solvent may be supplemented with from abouut 0.1 to about 10 weight percent of hydrogen in gaseous form in the liquefaction zone. Preferred hydrogen donors include indane, C_{10}–C_{12} Tetralins, C_{12} and C_{13} acenaphthenes, di-, tetra-, and octahydroanthracene, and tetrahydroacenaphthene.

3,645,886
REDUCING FOULING DEPOSITS IN PROCESS EQUIPMENT

Bruce G. Gillespie, Cranford, and Jack E. Ryer, East Brunswick, N.J., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 778,751, Nov. 25, 1968, now Patent No. 3,558,470, which is a continuation-in-part of application Ser. No. 694,039, Dec. 28, 1967. This application May 15, 1970, Ser. No. 37,846
Int. Cl. C10g 9/16; C10l 1/26; C23f 14/00
U.S. Cl. 208—48 AA 9 Claims

To reduce or prevent the fouling of process equipment in petroleum or chemical industries wherein an organic feedstock is subjected to heat exchange at a temperature of from about 200° to about 1300° F., there is added to that organic feedstock a very low concentration, of the order of about 0.5 to 200 parts per million, a mixture of about 75 to 99 wt. percent of a fatty acid ester of an alkanolamine and from about 1 to 25 wt. percent of a phosphorous acid or a mono, di, or tri-organic phosphite ester having the formula:

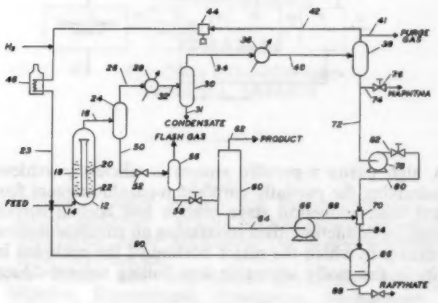


wherein R, R' and R'' are hydrogen or a hydrocarbon radical, including alkyl, aryl, aralkyl, alkaryl, cycloalkyl, or alkenyl, or a simple halogenated derivative of such hydrocarbon radical.

3,645,887
HEAVY OIL HYDROGEN TREATING PROCESS

William R. Mounce, East Windsor Township, N.J., assignor to Cities Service Research and Development Company, New York, N.Y.

Filed Apr. 28, 1970, Ser. No. 29,214
Int. Cl. C10g 13/02, 37/00
U.S. Cl. 208—96 6 Claims



A process for achieving a high conversion of residual heavy oil feedstock is disclosed. The process comprises withdrawing liquid effluent containing unconverted residual oil including thermally degraded material from an ebullated catalyst bed reactor operating at a temperature between about 800° F. and 900° F. and a pressure between 1500 p.s.i.g. and 400 p.s.i.g., mixing the unconverted residual oil with a naphtha stream condensed from reactor vapor effluent, separating the mixture into an extract containing unconverted residual oil miscible in the naphtha and a raffinate containing the thermally degraded material and recycling the extract to the reactor in order to increase the amount of available unconverted residual oil in the liquid phase in the reactor.

3,645,888
CATALYTIC REFORMING PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 828,762, May 28, 1969. This application June 26, 1970, Ser. No. 50,295
Int. Cl. C10g 35/08
U.S. Cl. 208—139 17 Claims

A gasoline fraction is catalytically reformed by contacting, in a reforming zone at reforming conditions, the gasoline fraction, hydrogen and water or a water-producing substance with a catalytic composite comprising a combination of a platinum group component, a germanium component and a halogen component with a porous

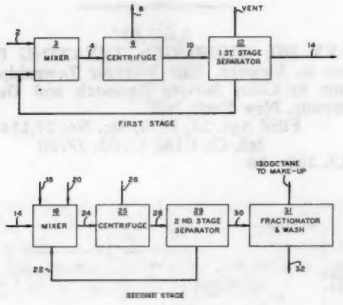
carrier material. Key feature involves maintaining the total amount of water, or water equivalent, continuously entering the reforming zone in the range of about 10 to about 50 wt. p.p.m. of the gasoline fraction.

3,645,889

ISOLATION OF n-PARAFFINS FROM MIXED BRANCH AND STRAIGHT CHAIN HYDROCARBONS

Donald O. Hanson, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 29, 1969, Ser. No. 888,230
Int. Cl. C07b 21/00
U.S. Cl. 208—308 6 Claims



A high purity n-paraffin stream is efficiently achieved by admixing the partially enriched n-paraffin stream from a first urea adduction stage with a low boiling solvent-diluent, re-adducting, then recovering an enriched n-paraffin stream in which the major portion of the occluded impurity is the easily separable low boiling solvent-diluent.

3,645,890

REVERSE OSMOSIS MEMBRANES FROM CRYSTALLINE POLYMERS OF VINYL METHYL ETHER

Carl A. Lukach and Harold M. Spurlin, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed May 6, 1969, Ser. No. 822,289
Int. Cl. B01d 39/00, 13/00
U.S. Cl. 210—23 10 Claims

Reverse osmosis membranes useful for desalination of water comprise thin films of crystalline homopolymers or copolymers of vinyl methyl ether which are either supported on a microporous substrate or in the form of thin walled hollow fibers.

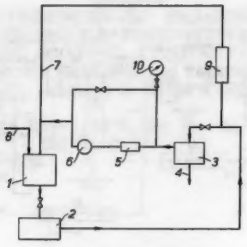
3,645,891

SEPARATION OF METAL COMPOUNDS

Alan Goldup, Weybridge, Michael Thomas Westaway, Ottershaw, and Geoffrey Walker, Woking, England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 22, 1969, Ser. No. 868,551
Claims priority, application Great Britain, Oct. 29, 1968, 51,232/68
Int. Cl. B01d 13/00
U.S. Cl. 210—23 15 Claims

An organometallic compound of a metal of Group VIII or VII–A or V–A of the Periodic Table according to Mendeleef is separated from a solution of the compound in an organic component, by bringing the solution into contact with one side of a silicone rubber membrane at an applied pressure greater than the pressure on the opposite side of the membrane, the pressure differential being greater than the osmotic pressure of the system and the molecular cross section of the organometallic com-



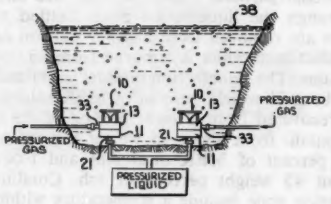
pound being greater than that of the organic component and collecting as a liquid the organic component which permeates the membrane, the permeate having a reduced content of the organometallic compound.

3,645,892

AERATION AND FOAM SEPARATION EMPLOYING VORTEX ELEMENT

Edward H. Schulman, Greenbelt, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

Filed June 13, 1969, Ser. No. 833,011
Int. Cl. B03d 1/00
U.S. Cl. 210—44 15 Claims



A vortex valve having supply and control inlet ports is supplied with pressurized gas and pressurized liquid at respective ones of its inlet ports, and provides an output flow comprising the liquid with interspersed tiny gas bubbles. The output flow may be employed to transfer the gas bubbles to a body of liquid for aeration purposes. Alternatively the output flow is employed in foam separation processes wherein the tiny gas bubbles efficiently induce flotation of surface-active or flocculent material suspended or otherwise immersed in a body of liquid.

3,645,893

METHOD OF TREATING ANIMAL WASTE

Ernst Rohrer, Boden, CH–9470 Buchs, Switzerland

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,452
Claims priority, application Switzerland, Aug. 22, 1968, 12,616/68
Int. Cl. C02c 5/02
U.S. Cl. 210—50 16 Claims

The invention relates to a method of treating waste from animal excreta in the form of manurial liquids by precipitating or flocculating the liquid and solid constituents and thereafter separated.

3,645,894

FREE-FLOWING PLASMA SPRAY POWDER

Casimir W. Krystyniak, Schenectady, N.Y., assignor to General Electric Company

Original application Dec. 1, 1965, Ser. No. 510,931, now Patent No. 3,429,962, dated Feb. 25, 1969. Divided and this application Aug. 16, 1968, Ser. No. 753,211
Int. Cl. B05b *7/20*; C04b *35/48*
U.S. Cl. 252—1 3 Claims

The preparation of metallic oxide layers and bodies consisting thereof by the plasma spray deposition of substantially spherically-shaped agglomerate particles of metal oxides, the particles being substantially uniform in composition and having as at least one of the metal oxides an oxide of a refractory metal, is described. Specific examples include a free-flowing powder of such spherical particles containing in physical combination (a) a first metal oxide selected from the group consisting of unstabilized zirconia and undoped thoria and (b) a second metal oxide selected from the group consisting of CaO, a mixture of rare earth oxides, Y_2O_3 and Yb_2O_3 and describe the deposition of such a powder by plasma arc spraying. As the result of this method of deposition the unstabilized ZrO_2 becomes stabilized or the undoped ThO_2 becomes doped.

3,645,895

SODIUM CHLORATE COMPOSITIONS OF REDUCED FIRE HAZARD CONTAINING AN ALKALI METAL SILICATE FIRE RETARDANT

John A. Peterson, Niagara Falls, N.Y., and Albert H. Ross, Niagara Falls, Ontario, Canada, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Jan. 15, 1968, Ser. No. 697,637
Int. Cl. C09k *3/28*; A01n *5/00*; B23p *1/16*
U.S. Cl. 252—8.1 14 Claims

An alkali metal silicate alone or in combination with one or more alkali metal or ammonium-chromate, hydroxide, carbonate, sulfate, borate and phosphate when added to solutions of an alkali metal or ammonium chlorate in minor amounts will act as flame retardants for combustible organic material upon which the chlorate has been deposited. The function of these flame retardants when added to chlorate containing solutions does not detract from the function of the chlorate solution in electrochemical machining, milling and grinding operations or in agricultural applications.

3,645,896

FILM FORMING HYDRAZINE-CONTAINING CORROSION INHIBITOR

Arthur L. Larsen, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Jan. 10, 1969, Ser. No. 790,485
Int. Cl. C23f *11/00*
U.S. Cl. 252—8.55 D 3 Claims

Corrosion rates in oil wells are reduced by injecting in combination from about 5 to about 200 p.p.m. of a film-forming nitrogen-containing corrosion inhibitor (e.g. an imidazoline compound) and 0.01–1.0 p.p.m. of hydrazine. Such is especially useful with water injection wells.

3,645,897

WATER BASED LUBRICANTS

Howard D. Gower, Munster, Ind., and Bob G. Gower, Park Forest, and David W. Young, Homewood, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 712,965, Mar. 14, 1968. This application Sept. 26, 1969, Ser. No. 861,500
Int. Cl. C10m *1/28*
U.S. Cl. 252—34.7 26 Claims

Water-soluble amine salts of styrene-maleic anhydride copolymer resins and half-esters thereof are employed in aqueous solutions as coolants and lubricants for metal working and operations. Metal working lubricant compositions are also formulated which comprise these amine salts along with extreme pressure agents such as amine salts of fatty acids and organic phosphate esters. Other additives may also be employed in the lubricating compositions of this invention.

ERRATUM

For Class 252—62.9 see:
Patent No. 3,645,974

3,645,898

MAGNET CORE BUILT UP FROM TITANIUM-CONTAINING MANGANESE-ZINC-FERROUS FERRITE AND METHOD OF MANUFACTURING THE SAME

Jacob Klerk and Theodorus Gerhardus Wilhelmus Stijntjes, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1969, Ser. No. 820,455
Claims priority, application Netherlands, May 2, 1968, 6806184
Int. Cl. C04b *35/38*
U.S. Cl. 252—62.59 5 Claims

A magnet core having a temperature factor of the effective magnetic initial permeability which is substantially constant over an extensive temperature range, especially suitable for use in inductance-capacitance filters in which polystyrene capacitors are used. The temperature variability of the capacity of the capacitors in question may then be compensated for by the temperature variability of the filter coils, in which the magnet cores according to the invention serve as core bodies.

The magnet cores according to the invention consist of a ferrite material having a composition lying within the following range of concentration limits of the five-components system MnO—ZnO—Fe_2O_3—TiO_2—FeO:

27–40 mol. percent MnO
8–16 mol. percent ZnO
40–49.5 mol. percent Fe_2O_3
0.5–7, preferably 2–6 mol. percent TiO_2
3–7.5 mol. percent FeO.

These cores are manufactured by mixing MnO, ZnO, Fe_2O_3 and TiO_2, or compounds which decompose upon heating to form those oxides in proportions yielding upon sintering the aforesaid materials, compacting the oxide mixture into cores which are heated to between 1100° C. and 1450° C. for 30 to 60 minutes and thereafter cooling in an atmosphere containing specified quantities of oxygen.

3,645,899

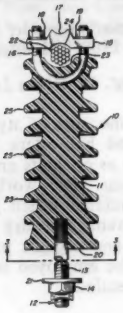
MOLDED EPOXY RESIN ELECTRICAL INSULATING BODY CONTAINING ALUMINA AND SILICA

Donald H. Linson, Mansfield, Ohio, assignor to The Ohio Brass Company, Mansfield, Ohio

Filed Aug. 19, 1968, Ser. No. 753,414

Int. Cl. H01b *3/08, 3/10, 3/40*

U.S. Cl. 252—63.5 4 Claims



There is provided a resinous molded insulating device, e.g. a line post insulator, having improved tracking characteristics at high voltages formed from an alicyclic diepoxy carboxylate which enables a substantial reduction in the amount of hydrated alumina contained in the resinous body over that required with other resins. The invention also relates to a method of producing these products characterized by the ability to interrupt the hardening reaction occurring with the compositions at the gel stage when the product is quite rubbery but cohesive whereby the product is removed from the mold in the partially cured state and the cure is completed outside the mold.

3,645,900

ELECTRO-INSULATING VARNISHES

Klaus Ohm and Joseph Weder, Offenbach am Main, Germany, assignors to Schramm Lack- und Farbenfabriken Aktiengesellschaft, Offenbach am Main, Germany

No Drawing. Filed Sept. 16, 1968, Ser. No. 762,378

Claims priority, application Germany, Sept. 21, 1967, P 16 69 046.3

Int. Cl. H01b *3/30;* B44d *1/42*

U.S. Cl. 252—63.7 18 Claims

Electro-insulating stoving varnish made by condensing itaconic acid or an ester of itaconic acid with a monoamino or diamino compound.

3,645,901

WATER-IN-OIL HYDRAULIC FLUID

Howard J. Matson, Harvey, Ill., assignor to Atlantic Richfield Company

No Drawing. Filed Oct. 3, 1968, Ser. No. 764,964

Int. Cl. C09k *3/00*

U.S. Cl. 252—75 18 Claims

Fire resistant, water-in-oil emulsions suitable for use as hydraulic fluids and having improved wear resistance over a wide range of operating conditions, including high pressure conditions, are obtained by incorporating anti-wear additives into the oil phase and certain additives which exhibit anti-wear properties in the water phase. The water phase anti-wear additives include the alkanolamine salts of boric acid and the trialkanolamine borates.

3,645,902

FRICTION OR TRACTIVE DRIVE FLUID COMPRISING ADAMANTANES

Irl N. Duling, West Chester, Frederick P. Glazier, Thornton, and David S. Gates, Swarthmore, Pa., and Robert E. Moore, Wilmington, Del., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Nov. 14, 1969, Ser. No. 876,993

The portion of the term of the patent subsequent to Aug. 3, 1988, has been disclaimed

Int. Cl. C09k *3/00*

U.S. Cl. 252—73 11 Claims

A friction or tractive drive comprises at least two relatively rotatable members in torque transmitting relationship, the tractive surfaces of the members having disposed thereon one or more tractants selected from at least one of the following groups (1) or (2):

(1) a tractant comprising alkylated adamantane hydrocarbon having one adamantane nucleus per molecule with the C_3–C_{20} alkyl moiety as a bridgehead substituent; and,

(2) bis-type hydrocarbon product having two adamantane nuclei linked between bridgehead positions through the C_3–C_{20} alkylene moiety.

3,645,903

WATER-IN-OIL EMULSION HYDRAULIC FLUIDS

Michael A. Stram, Chicago, and Charles L. Zuraw, Harvey, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Feb. 14, 1969, Ser. No. 799,506

Int. Cl. C09k *3/00*

U.S. Cl. 252—77 13 Claims

Stable, water-in-oil emulsions are provided by emulsifying water and mineral oil with oil-soluble mixed imides of styrene-maleic anhydride copolymers which are imidized to at least about 50 mole percent and preferably about 100 mole percent. These emulsions can be readily formed by dissolving in mineral oil an emulsifying amount, such as about 2 to 15 percent by weight of the oil, of the mixed imide and mixing with up to about an equal or more amount of water. The oil-soluble mixed imide is the reaction product of a styrene-maleic anhydride copolymer with a dialkylaminoalkylamine, such as dimethylaminopropylamine, and a primary alkylamine, such as N-stearylamine or a C_{20-22} primary alkylamine, in a mole ratio of dialkylaminoalkylamine to primary alkylamine of about 1:3 to less than about 2:1, the total amount of amines being sufficient to imidize at least about 50 mole percent, and preferably about 100 mole percent, of the styrene-maleic anhydride copolymer. These emulsions possess good stability and rust inhibiting properties. They can be used as lubricating compositions and hydraulic fluids.

3,645,904

SKIN CLEANER

Willis J. Beach, Saginaw, Mich., assignor to Sugar Beet Products Company, Saginaw, Mich.

No Drawing. Filed July 27, 1967, Ser. No. 656,326

Int. Cl. C11d *9/04*

U.S. Cl. 252—89 10 Claims

A skin cleaner of the type having plastic synthetic resin materials in a fine state of comminution included therein

so as to impart a scrubbing or mechanical detersive action thereto.

3,645,905
CORROSION INHIBITED MULTI-PURPOSE METAL CLEANER

Myer Rosenfeld, Baltimore, and Troy R. Nichols, Bel Air, Md., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Dec. 1, 1969, Ser. No. 881,305
Int. Cl. C09d *9/04;* C11d *3/08;* C23f *11/06*
U.S. Cl. 252—540 8 Claims

A multi-purpose cleaner comprising sodium metasilicate, dodecyl benzene sodium sulfonate, and a nonionic surfactant in combination with a metal corrosion inhibitor consisting of sodium or potassium stannate.

3,645,906
NOVEL COMPOSITIONS OF MATTER AND METHODS FOR PREPARING THE SAME

Joseph C. Valenta and Alfred F. Steinhauer, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 228,026, Oct. 3, 1962. This application Aug. 6, 1968, Ser. No. 750,494
Int. Cl. C11d *1/24, 7/50;* D06l *1/02*
U.S. Cl. 252—171 2 Claims

The present invention involves making clear solutions of hydrophobic liquids and water or aqueous solutions of acids, bases, or salts. It is shown that an alkylated diphenyloxide sulfonic acid salt alone, if halogenated, or if unhalogenated then in combination with certain commercial surfactants, will solubilize into a clear solution a hydrophobic liquid (e.g., chlorinated hydrocarbon) and water, or a solution of an acid, base, or salt in water.

3,645,907
COMPOSITION PREPARED BY TREATING DIAMINE-KETONE MIXTURES WITH CALCIUM CARBIDE

William E. Jackson, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Summit, Ohio

No Drawing. Filed Aug. 25, 1969, Ser. No. 869,984
Int. Cl. C08g *22/04, 51/84*
U.S. Cl. 252—182 3 Claims

A composition and method of preparation which comprises treating a mixture of a diamine having primary amino groups and liquid ketone with calcium carbide and a method of curing a polyurethane therewith. The composition and method are particularly useful in the preparation of curatives for polyurethane.

3,645,908
KETONE PEROXIDE COMPOSITION STABILIZED WITH AN AMINE

Wolfgang Edl, Grosshesselohe, Gebhard Faber, Hohenschaftlarn, Michael Koehler, Munich, Heinz Winter, Pullach, and Heinz Meyer, Munich, Germany, assignors to Elektrochemische Werke Munchen Aktiengesellschaft, Hollriegelskreuth, near Munich, Germany

No Drawing. Filed Sept. 25, 1967, Ser. No. 670,444
Claims priority, application Germany, Sept. 23, 1966, E 32,532; May 31, 1967, E 34,095
Int. Cl. C07c *73/00;* C08f *1/60*
U.S. Cl. 252—186 8 Claims

A cross-linking composition which is particularly suitable for the cross-linking of unsaturated polyester resins, contains at least one ketone peroxide, a solvent therefor, and at least one amine compound.

3,645,909
VARIABLE DENSITY LIGHT FILTERING SYSTEM

Richard J. Hovey, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 30, 1969, Ser. No. 837,764
The portion of the term of the patent subsequent to Oct. 29, 1985, has been disclaimed
Int. Cl. F21v *9/00, 9/06;* G02b *5/24*
U.S. Cl. 252—300 9 Claims

A system having the property of automatically varying in optical density in response to a variation in incident light including a solution of a photochromic leuco dye and a completely reversible reducing agent both dissolved in a high viscosity polyhydric alcohol.

3,645,910
AQUEOUS SOL AND GEL OF ZIRCONIUM COMPOUNDS

James Louis Woodhead, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

No Drawing. Original application June 5, 1967, Ser. No. 643,348, now Patent No. 3,518,050, dated June 30, 1970. Divided and this application Nov. 14, 1969, Ser. No. 877,047
Claims priority, application Great Britain, June 9, 1966, 25,840/66
Int. Cl. B01j *13/00;* C01g *25/00*
U.S. Cl. 252—313 R 2 Claims

The invention discloses a novel zirconium compound wherein the ratio of nitrate to zirconia is about 1.1. This compound is made by reacting zirconium hydroxide or carbonate with nitric acid to provide a water-based sol. The sol may be converted into the gel by drying at about 80–90° C. over a period of a few days to give a solid glassy mass which can easily be re-dissolved in water to give the sol. The gel has the empirical formula:

$$[Zr_4(OH)_{12}(NO_3)_2(H_2O)_4](NO_3)_2 \cdot 2H_2O$$

and contains lattice water, covalent nitro groups and ionic nitrate groups.

3,645,911
METHOD FOR ENCAPSULATING AQUEOUS OR HYDROPHILIC MATERIAL

Jan Frans van Besauw, Brasschaat, and Daniel Alois Claeys, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,545
Claims priority, application Great Britain, Nov. 20, 1968, 55,080/68; Dec. 31, 1968, 2,229/68
Int. Cl. A61k *9/04;* B01j *13/02;* G03c *1/10*
U.S. Cl. 252—316 7 Claims

In the encapsulation of water-soluble substances according to U.S. Pat. 3,523,906, a variation in the concentration of such substance in the aqueous core solution is avoided by incorporating in the aqueous continuous phase containing a hydrophilic colloid, the same water-soluble substance to be encapsulated in a concentration at least as great as its concentration in the aqueous core solution.

3,645,912
REGENERATION OF UNSUPPORTED VANADIUM SULFIDE CATALYST

John G. Gatsis, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,000
Int. Cl. B01j *11/76, 11/02*
U.S. Cl. 252—411 R 2 Claims

A carbonized, unsupported vanadium sulfide catalyst is regenerated with hydrogen sulfide or elemental sulfur by way of a two-stage treatment at elevated temperatures. The first stage is effected at temperatures above about

500° C., whereby carbon disulfide is formed, and the second stage is effected at temperatures below about 500° C., whereby vanadium tetrasulfide is formed. In a preferred method, the carbonized catalyst and elemental sulfur are contacted and heated in a hydrogen sulfide atmosphere. Further, carbon disulfide may be used at the lower temperature to form the vanadium tetrasulfide.

3,645,913

REGENERATION OF COPPER OXIDE AND COPPER CHROMITE CATALYSTS

Clarence E. Habermann, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 5, 1969, Ser. No. 882,715
Int. Cl. B01j *11/30, 11/66*
U.S. Cl. 252—416 **8 Claims**

The activity of a copper oxide or copper chromite catalyst deactivated while being used to convert a nitrile to the corresponding amide may be regenerated by oxidizing the used catalyst in an oxygen-containing gas at an elevated temperature and then contacting the oxidized copper oxide or copper chromite with a reducing agent such as hydrogen at an elevated temperature.

3,645,914

CONVERSION OF INORGANIC OXIDES INTO EXTRUDABLE BINDERS

Edward J. Rosinski, Deptford, and Kenneth G. Simmons, Woodbury, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Mar. 19, 1969, Ser. No. 808,662
Int. Cl. B01j *11/40, 11/06*
U.S. Cl. 252—455 R **18 Claims**

A method of rendering solid synthetic hydrous metal oxides or modified natural metal oxides in the form of a powder smaller than about 20 mesh (Tyler) containing 1–30 weight percent water at 1000° F. suitable for catalysts, catalyst binder or catalyst support by a rehydration process employing liquid water and/or steam at temperatures above 100° F. for at least 0.25 hour effecting a hydration of 10–80 weight percent water.

3,645,915

STABILIZED NICKEL OXIDE-NICKEL CHROMITE REFORMING CATALYST

Alvin B. Stiles, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,257
Int. Cl. B01j *11/06*
U.S. Cl. 252—462 **5 Claims**

A nickel oxide-nickel chromite catalyst stabilized with the oxides of lanthanum or uranium is useful in the steam reforming of hydrocarbons. The catalyst can optionally contain other oxides as promoters, e.g. manganese oxide, magnesium oxide, cerium oxide and rare earth oxides.

3,645,916

METALLIC MORTARS

William Cornelius Hall, Albany Turnpike, Central Valley, N.Y. 10917, and John Merriam Peterson, Foleman Road, Rock Tavern, N.Y. 12575

No Drawing. Filed Nov. 2, 1967, Ser. No. 679,981
Int. Cl. C04b *31/18, 35/68*
U.S. Cl. 252—478 **21 Claims**

Metallic mortars containing an iron ore concentrate characterized by its high bulk density, its blackish shining appearance, and its sharp crystalline corners and flat cleavage planes, uniformly dispersed as a fine aggregate throughout an inorganic cement matrix.

3,645,917

POLYETHERS CONTAINING AZIDOMETHYL SIDE CHAINS

Edwin J. Vandenberg, Foulk Woods, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Feb. 25, 1970, Ser. No. 14,186
Int. Cl. C08g *23/06*
U.S. Cl. 260—2 A **8 Claims**

High molecular weight polyethers are provided that contain azidomethyl groups pendant from the main polymer backbone. These polymers are characterized by containing from 0.2 to 100% of azidomethyl ethylene oxide repeating units. They are prepared by reacting a polymer of an epihalohydrin with a metal azide. The azidomethyl polyethers can be cross-linked by heating at low temperature (under 100° C.).

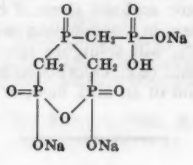
3,645,918

COPOLYMERS FROM ESTERS, SALTS AND ACIDS OF PARTIAL ANHYDRIDES OF PHOSPHINE OXIDE

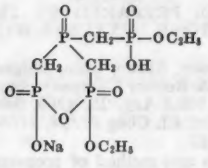
Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 832,492, June 11, 1969. This application Oct. 20, 1970, Ser. No. 82,532
Int. Cl. C08g *33/16, 33/20*
U.S. Cl. 260—2 P **9 Claims**

Copolymers prepared by copolymerizing a polyhydric compound or a polyamine compound with a partial anhydride of an alkylidene phosphonyl phosphine oxide such as:



or



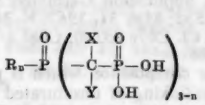
3,645,919

COPOLYMERS FROM PHOSPHINE OXIDE ANHYDRIDES

Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 832,410, June 11, 1969. This application Oct. 20, 1970, Ser. No. 82,534
Int. Cl. C08g *33/16, 33/20*
U.S. Cl. 260—2 P **12 Claims**

Polymers prepared by copolymerizing a reactive hydrogen-containing material from the group polyhydric compounds and polyamine compounds with a full anhydride of an organoalkylidene phosphonyl phosphine oxide having the formula:



wherein R, X, Y and *n* are defined in the specification.

3,645,920

PROCESS OF POLYMERIZING A 1,2-MONOEPOXIDE WITH A POLYMERIC HYDROCARBYL ALUMINUM ALKOXIDE CATALYST

Robert K. Schlatzer, Jr., Chagrin Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,097
Int. Cl. C08g *23/14*
U.S. Cl. 260—2 A 4 Claims

There is disclosed a process of polymerizing an epoxide-type monomer such as epichlorohydrin or ethylene oxide employing a new catalyst comprising the complex reaction product of a polymeric hydrocarbyl aluminum alkoxide containing Al—O—Al type linkages with (1) a chelator, (2) water and optionally (3) an ether. Such process produces rubbery polymerized epoxides having a polyether structure which have higher molecular weights and, with the epihalohydrins polymerized alone, more regular structures as indicated by higher crystallinity indices than corresponding polymers made with prior catalysts. The new catalysts also provide a higher yield of polymer per unit of catalyst at more vigorous reaction rates than do prior catalysts. The polyether type rubbers have considerable commercial utility because of their properties of good solvent-, fuel-, oil- and ozone-resistance which are effectively retained over a wide range of temperatures.

3,645,921

REGENERATION OF ANION EXCHANGE RESINS

Eli Salem, Brooklyn, N.Y., and Donald J. Butterworth, Lyndhurst, and Leo F. Ryan, Somerville, N.J., assignors to Ecodyne Corporation, Chicago, Ill.

Filed Apr. 20, 1970, Ser. No. 30,058
Int. Cl. B01d *15/06;* C02b *1/76*
U.S. Cl. 260—2.1 R 11 Claims

The invention relates to a method for converting strong-base anion exchange resins from the monovalent anion form to the hydroxide form. A solution of polyvalent anions is first passed through the resin to displace the monovalent anions. A solution of alkali metal hydroxide is then passed through the resin to convert it to the hydroxide form, and to produce an effluent solution of hydroxide ions and polyvalent anions. This effluent solution is then neutralized with an acid containing polyvalent anions, and the neutralized solution is passed through a second batch of resin in the monovalent anion form. In the preferred embodiment, a portion of the effluent is retained without neutralization and is delivered to the second batch of resin after the neutralized effluent to perform a portion of the hydroxide regeneration.

3,645,922

ION-EXCHANGE RESINS

Donald Eric Weiss, Blackburn, Victoria, Brian Alfred Bolto, Mitcham, Victoria, and Donald Willis, Blackburn, Victoria, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, East Melbourne, Victoria, Australia

Filed Nov. 22, 1968, Ser. No. 778,154
Claims priority, application Australia, Nov. 22, 1967, 30,165/67
Int. Cl. C08f *29/30, 29/36, 29/50*
U.S. Cl. 260—2.1 R 30 Claims

Composite ion exchange adsorbent in particulate form comprising particulate acidic and basic ion exchange materials dispersed in a homogeneous matrix of a water-insoluble and ion-permeable polymeric material, preferably poly (vinyl alcohol). Such adsorbents may be made by dispersing the ion exchange materials in a solution of the polymeric material in a solvent, dispersing the dispersion in a medium immiscible with the solution, and removing at least a part of the solvent. The adsorbent is particularly suitable for use in the demineralisation of salt solutions.

3,645,923

CARBODIIMIDE FOAM COMPOSITION AND PROCESS FOR THE PREPARATION THEREFOR

Peter T. Kan, Livonia, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,985
Int. Cl. C07c *119/04;* C08g *53/08*
U.S. Cl. 260—2.5 9 Claims

Novel carbodiimide foams are prepared by condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of a 2,4,6-tris(dialkanolamino)-s-triazine catalyst. The foams of the present invention are rigid, dense, cellular compositions which exhibit excellent flame retardancy and low smoking characteristics.

3,645,924

PROCESS FOR PREPARING FLEXIBLE POLYURETHANE FOAMS AND POLYURETHANE COATINGS

Adolf Wojciech Fogiel, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 814,434, Apr. 8, 1969, which is a continuation-in-part of application Ser. No. 765,034, Oct. 4, 1968. This application Feb. 3, 1970, Ser. No. 8,420
Int. Cl. C08g *22/24, 22/36*
U.S. Cl. 260—2.5 AC 18 Claims

Aliphatic isocyanate based polyurethane foams and coatings. The foams are prepared from aliphatic polyisocyanates, polyols and water in quasi-prepolymer, full prepolymer or one-shot systems using a 2-substituted-1,1,3,3-tetraalkyl guanidine catalyst. The coatings are conventional isocyanato - terminated polyurethane prepolymers cured with moisture in the presence of a 2-substituted-1,1,3,3-tetraalkyl guanidine.

3,645,925

4,4'-DIMORPHOLINODIETHYL ETHER CATALYST FOR POLYURETHANE PREPARATION

George P. Speranza and Michael Cuscurida, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed July 31, 1970, Ser. No. 60,087
Int. Cl. C08g *22/38, 22/44*
U.S. Cl. 260—2.5 AC 4 Claims

A new amine catalyst for a polyurethane reaction is 4,4'-dimorpolinodiethyl ether. The catalyst is specific for the isocyanate water portion of the urethane reaction and, therefore, is a valuable means of balancing the competing reactions during urethane formation. Flexible polyurethane foams may be used, for example, in cushioning, while rigid polyurethane foams may be used, for example, as insulation.

3,645,926

STABILIZED, SELF-EXTINGUISHING LATEX FOAM RUBBER

Alfred Norman Dunlop, Windsor, Ontario, Canada, assignor to Polymer Corporation Limited, Sarnia, Ontario, Canada

No Drawing. Continuation of application Ser. No. 704,507, Feb. 12, 1968. This application Oct. 29, 1970, Ser. No. 85,219
Claims priority, application Canada, Feb. 18, 1967, 983,202
Int. Cl. C08f *47/10, 15/26, 37/18*
U.S. Cl. 260—2.5 L 5 Claims

By employing a latex blend having at least 60% solids, which is prepared by:

(a) blending (1) a latex of a resinous vinylidene halide copolymer having ethylenic unsaturation with (2) a latex of a rubbery diolefinic hydrocarbon/vinylidene chloride copolymer,

(b) subjecting this latex blend to coagglomeration treatment,
(c) adding additional resinous latex (1) such that the total halogen of the contained polymers is of the order of 38%,
(d) concentrating this final latex to a solids content of at least 60% yet a viscosity of no more than 12 poise when at 60% solids, and
(e) compounding, foaming, gelling and vulcanizing the concentrated blend,

there is produced a flame-retardant foam rubber composition.

3,645,927
POLYURETHANE CATALYST
Karlheinz Andres, Cologne, Flittard, Franz Karl Brochhagen, Odenthal, Anton Wunderer, Leverkusen, and Josef Fulber, Osnabrueck, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed May 13, 1969, Ser. No. 824,313
Claims priority, application Germany, May 15, 1968, P 17 69 367.3
Int. Cl. C08g *22/42, 22/44*
U.S. Cl. 260—2.5 AB **4 Claims**

A catalyst is provided for the production of urethane-containing polymers by the reaction between an organic polyhydroxy compound and an organic polyisocyanate in the presence of a blowing agent wherein di-n-octyl tin mercaptide is used as the activator for the isocyanate/hydroxyl hydrogen reaction.

3,645,928
PROCESS FOR THE PREPARATION OF POLYLACTAM FOAMS
Nobuo Wakamura, Hiroshi Okada, Atsushi Osakada, and Takashi Tanaka, Otsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan
No Drawing. Filed July 16, 1969, Ser. No. 842,394
Int. Cl. C08j *1/20, 1/26*
U.S. Cl. 260—2.5 N **8 Claims**

An improved process is provided for the preparation of polylactam foams in which ϵ-caprolactam or a mixture of lactams containing more than 50 mol percent of ϵ-caprolactam is anionically polymerized in the presence of an alkali catalyst, a blowing agent and a promoter at a temperature of about 100–180° C. The improved process is particularly characterized by the use of a promoter which when added to a mixture of lactam and alkali catalysts causes the mixture to solidify due to crystallization within 3 minutes and to produce a polylactam having a relative viscosity of at least 3 when a conversion reaches equilibrium. The polylactam foams of this invention exhibit improved mechanical and chemical properties in comparison with the polylactam foams of the prior art which make them especially useful for the manufacture of low density articles requiring relatively high strength and chemical resistance.

3,645,929
EXPANDABLE INSULATION COMPOSITIONS
James K. Normanton, Bishop Auckland, Durham, England, assignor to Bakelite Xylonite Limited
No Drawing. Filed July 22, 1969, Ser. No. 843,766
Claims priority, application Great Britain, July 19, 1968, 34,508/68
Int. Cl. C08f *47/10, 29/04;* **B44d** *1/42*
U.S. Cl. 260—2.5 E **10 Claims**

Expandable compositions for electrical conductor insulation contain low density polyethylene and a small amount of high density polyethylene or polypropylene; expanded compositions and electrical conductor coated therewith.

3,645,930
EXPANDABLE COMPOSITIONS AND PRODUCTS
James K. Normanton, Bishop Auckland, Durham, England, assignor to Bakelite Xylonite Limited
No Drawing. Filed July 22, 1969, Ser. No. 843,767
Claims priority, application Great Britain, July 19, 1968, 34,510/68
Int. Cl. C08f *29/04, 47/10;* **B44d** *1/42*
U.S. Cl. 260—2.5 E **7 Claims**

Azodicarbonamide is used with a second organic blowing agent to form cellular ethylene polymer products adaptable for electrical conductor insulation.

3,645,931
BLOWING AGENT COMPOSITIONS
James K. Normanton, Bishop Auckland, Durham, England, assignor to Bakelite Xylonite Limited
No Drawing. Filed July 22, 1969, Ser. No. 843,768
Claims priority, application Great Britain, July 19, 1968, 34,509/68
Int. Cl. C08f *29/04, 47/10;* **C09k** *3/00*
U.S. Cl. 260—2.5 R **8 Claims**

Blowing agent compositions comprising azodicarbonamide and a secondary blowing agent adaptable for expanding plastic materials.

3,645,932
NUCLEATION OF HIGH MOLECULAR WEIGHT POLYAMIDES
Stuart A. Harrison and Kenneth B. Stokes, Minneapolis, Minn., assignors to General Mills, Inc.
No Drawing. Continuation-in-part of application Ser. No. 612,816, Jan. 31, 1967. This application May 22, 1969, Ser. No. 827,039
Int. Cl. C08g *41/04*
U.S. Cl. 260—3 **13 Claims**

Relates to a process of developing rapidly the ultimate crystalline characteristics of certain polyamide resins derived from polymeric fat acids by the incorporation therein of a variety of nylon and other polyamide resins, polyethylene, polypropylene, polycarbonates and polyethylene acrylic acid copolymer ionomers.

3,645,933
COATING COMPOSITION INCLUDING ISOCYANATE-MODIFIED POLYESTER AND CHLORINATED RUBBER
Thomas F. Flint, Laurel Springs, N.J., assignor to The Sherwin-Williams Company, Cleveland, Ohio
No Drawing. Filed Nov. 12, 1969, Ser. No. 876,108
Int. Cl. C08c *9/16;* **C08d** *9/10;* **C08g** *17/16*
U.S. Cl. 260—3.3 **9 Claims**

There is provided an improved coating composition particularly useful for highway marking paints and characterized by extremely fast dry time. The composition includes as essential ingredients an isocyanate-modified polyester such as toluene diisocyanate modified linseed oil/glycerol/phthalate and a chlorinated rubber.

3,645,934
OZONE RESISTANT BLENDS OF NATURAL RUBBER/POLYCHLOROPRENE/EPDM COPOLYMER AND A PROCESS FOR THE PREPARATION THEREOF
Stanley William Caywood, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 10, 1970, Ser. No. 62,595
Int. Cl. C08c *9/10*
U.S. Cl. 260—5 **11 Claims**

There is provided a vulcanizable elastomeric composition having improved resistance to ozone and a process for its preparation. The process consists essentially of preparing a premix by mixing about 15–30 parts based on the total weight of rubbers of a random, linear elastomeric ethylene/propylene/open-chain non-conjugated diene co-

polymer having a Mooney viscosity (ML–1+4/121° C.) of about 35–75 with about 20–35 parts based on the total weight of rubbers mercaptan-modified sol of a polymer of chloroprene having a Mooney viscosity (ML–1+2.5/100° C.) of about 50, and about 25–60 parts based on the total weight of rubbers of a reinforcing carbon black having an EM surface area of at least about 40 square meters per gram, and mixing the premix with about 50–60 parts based on the weight of total rubbers of natural rubber.

3,645,935

MERCAPTO CARBOXYLIC ACID MODIFIED BUTYL RUBBER

Charles E. Scott, Yardley, Pa., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Apr. 23, 1968, Ser. No. 723,574
Int. Cl. C08d *5/04*
U.S. Cl. 260—5 **19 Claims**

A modified butyl rubber containing carboxyl groups pendant to the polymer backbone. Butyl rubber is halogenated and the halogenated butyl rubber reacted with a mercapto carboxylic acid. Substitution of at least part of the halogen by the mercapto carboxylic acid occurs, presumably through the mercaptan group.

3,645,936

FLAME-RETARDANT REGENERATED CELLULOSE FILAMENTS

Brian C. Gardner, Kenilworth, England, assignor to Courtaulds Limited, London, England

No Drawing. Filed May 5, 1970, Ser. No. 34,868
Claims priority, application Great Britain, May 9, 1969, 23,676/69
Int. Cl. C08g *51/56;* **D01f** *3/12;* **D06m** *13/44*
U.S. Cl. 260—9 **10 Claims**

Flame retardant regenerated cellulose filaments incorporate both tris (2,3 dibromopropyl) phosphate (TDBPP) and a polymer made by reacting excess ammonia with tetrakishydroxymethyl phosphonium chloride (THPC) or THPC/urea or THPC/urea/melamine.

3,645,937

FOUNDRY SAND COMPOSITIONS CONTAINING GRAFT COPOLYMERS OF ACRYLIC ACID WITH WATER-SOLUBLE POLYHYDROXY POLYMERIC COMPOUNDS

William J. Lang, Libertyville, and John J. Krajewski, Wheeling, Ill., assignors to International Minerals & Chemical Corporation

No Drawing. Filed Sept. 4, 1968, Ser. No. 757,473
Int. Cl. B22c *1/26*
U.S. Cl. 260—17 A **16 Claims**

A sand core and mold composition for use in casting metals comprising foundry sand, clay, water and from about 0.0025% to about 1% by weight of a water-soluble graft copolymer of acrylic acid and a minor amount of a water-soluble polyhydroxy polymeric compound, including water-soluble salts thereof.

3,645,938

ADHESIVE COMPOSITIONS FOR WATER-WET CELLULOSIC MEMBRANES

Gerard J. Clarke, Rochester, and Martin E. Rowley, Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Jan. 2, 1969, Ser. No. 788,613
Int. Cl. C09j *3/14*
U.S. Cl. 260—17 **2 Claims**

Water-wet cellulose acetate membranes can be joined together effectively by use of a liquid adhesive composition containing 2-ethoxyethyl acetate and/or methyl ethyl ketone and a compatible polymer.

The adhesive compositions can also contain a small amount of a tackifying resin such as poly(α-methyl styrene).

3,645,939

COMPATIBILIZATION OF HYDROXYL CONTAINING MATERIALS AND THERMOPLASTIC POLYMERS

Norman G. Gaylord, New Providence, N.J., assignor to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio

No Drawing. Filed Feb. 1, 1968, Ser. No. 702,204
Int. Cl. C08f *29/10, 29/20 29/30*
U.S. Cl. 260—17.4 GC **18 Claims**

Composites are prepared from a material containing hydroxyl groups, such as cellulose, starch, polyvinyl alcohol, sand, metal or glass and a thermoplastic material containing labile atoms, such as polyethylene or polyvinyl chloride, by reacting the materials with a coupling agent, such as maleic anhydride, in the presence of a free radical initiator. An improved method for incorporating fillers or reinforcing agents into thermoplastic polymers is also provided by precoating the filler or reinforcing agent with a thermoplastic material containing labile atoms in the presence of a coupling agent and a free radical initiator.

3,645,940

POLYSACCHARIDE-REINFORCED RUBBER

Howard L. Stephens, Akron, and Thomas F. Reed, Cuyahoga Falls, Ohio, assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,195
Int. Cl. C08d *9/06;* **C08c** *9/12*
U.S. Cl. 260—17.4 BB **11 Claims**

Moist polysaccharide-rubber coprecipitates are subjected to vigorous hot mechanical working during the critical phase inversion from rubber particles in a polysaccharide matrix to polysaccharide particles in a rubber matrix. This yields masterbatches which have better dispersion of polysaccharide in rubber than has been previously attained, and which provide vulcanizates having greatly improved strengths and elastic properties.

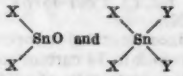
3,645,941

METHOD OF PREPARING 2-p-DIOXANONE POLYMERS

Thomas C. Snapp and Alden E. Blood, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,877
Int. Cl. C08g *17/02*
U.S. Cl. 260—18 **10 Claims**

This invention relates to a method for preparing homopolymer of 2-p-dioxanone having molecular weights within the range of from about 2000 to about 4000 by utilizing an organotin catalyst having one of the general formulae:



in which the X's represent an alkyl, aryl, aralkyl, or an acyloxy radical and the Y's represent an alkyl, aryl, aralkyl, acyloxy, halogen, or hydroxy radical. These polymers are especially suitable as surface coating materials, e.g. waxes and polishes.

3,645,942

FOUNDRY PROCESS USING A PROPOXYLATED TOLUENE DIAMINE AS AN EXTENDER WITH A CASTOR OIL-AROMATIC DIISOCYANATE PREPOLYMER

Lloyd H. Brown, Crystal Lake, and Laurence J. Klemm, Elgin, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed Apr. 29, 1970, Ser. No. 33,102
Int. Cl. B22c *1/24;* **C08g** *22/04*
U.S. Cl. 260—18 TN **4 Claims**

A foundry process is disclosed including the use of novel core binders which are prepared by first forming

a prepolymer from an aromatic polyisocyanate and non-drying castor oil; then mixing the prepolymer with a high molecular weight hydroxy containing material and an accelerator. The high molecular weight hydroxy containing material can be either an aliphatic polyether polyol or an aromatic polyether polyol. The accelerator can be either a metal naphthenate, organotin compound, or tertiary amine. The prepolymer may also include tung oil.

3,645,943

FREE ISOCYANATE-BLOCKED WRINKLE FINISH COATING COMPOSITIONS AND ARTICLES COATED THEREWITH

Arthur J. Krawczyk, Cheektowaga, N.Y., assignor to Textron Inc.

No Drawing. Filed June 19, 1970, Ser. No. 47,894

Int. Cl. C09d *3/72, 5/28*

U.S. Cl. 260—22 TN **33 Claims**

There is disclosed a normally-liquid, free isocyanate-blocked coating composition which forms a wrinkle-finish coating upon curing, comprising (I) the reaction product of (A) a diisocyanate-aliphatic polyol urethane prepolymer and (B) an isocyanate-reactive oxime, said reaction product containing an essentially stoichiometric equivalent of (B) per equivalent of free isocyanate in (A); and (II) a minor amount sufficient to cause a wrinkle-finish upon curing, e.g., at least about 0.1 weight percent based on the total solids content of urethane prepolymer and oxime in the composition, of zinc in the form of a zinc salt of an α-alkyl branched fatty acid, said zinc salt having been incorporated in the composition after the formation of the reaction product (I). Advantageously, a polyhydroxyl-containing crosslinking agent is also present in the liquid coating compositions and is also incorporated after the formation of the reaction product (I). A process of curing such compositions to effect a wrinkle-finish coating and articles coated therewith are also disclosed.

3,645,944

METALLIC SALTS OF MIXED ACIDS AS STABILIZERS FOR RIGID VINYL RESIN COMPOSITIONS

Edward L. White, Freehold, and William D. Lang, Rahway, N.J., assignors to NL Industries, Inc.

No Drawing. Original application July 31, 1968, Ser. No. 748,945, now Patent No. 3,562,180, dated Feb. 9, 1971. Divided and this application Oct. 6, 1970, Ser. No. 78,556

Int. Cl. C08f *45/62*

U.S. Cl. 260—23 XA **2 Claims**

Lead salts of mixed saturated monocarboxylic aliphatic acids containing from 8 to 14 carbon atoms, lead salts coformed with alkaline earth salts of said mixed acids, and process therefor, as stabilizers for rigid vinyl halide resin compositions.

3,645,945

ASPHALT COMPOSITION

Sherman D. Lesesne, Georgetown, and George P. Speranza, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed Feb. 15, 1967, Ser. No. 616,156

Int. Cl. C08g *51/52*

U.S. Cl. 260—28 **2 Claims**

The ductility and the elasticity of an asphalt composition is improved by the in situ formation therein of a polyurethane polymer from added polyol and organic polyisocyanate components. These resultant improved asphalt compositions are desirable for paving surfaces, roofing applications, soil stabilization, sealants and other applications wherein elasticity and ductility are important. The improved asphalt composition exhibits excellent heat stability after being held at high temperatures for an extended period of time.

3,645,946

WAX COMPOSITION

Stuart Lyman, Chicago, Ill., assignor to Surety Manufacturing Co., Inc., Dolton, Ill.

No Drawing. Filed June 23, 1969, Ser. No. 835,803

Int. Cl. C08g *51/52*

U.S. Cl. 260—28 **5 Claims**

A water-dispersible wax composition comprising a silicone, a cationic surfactant, a wax-like binder, an inorganic carrier having a high surface area, and a free flow agent.

3,645,947

LACTONE-DIENE-VINYL-AROMATIC TERPOLYMER EMULSIONS

Donald J. Quigg and James N. Short, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed June 25, 1970, Ser. No. 49,997

Int. Cl. C08d *9/10*

U.S. Cl. 260—28.5 **10 Claims**

Rubber emulsions, comprising (a) a lactone terpolymer, solvent, emulsifying agent and water or (b) a lactone terpolymer, asphalt, solvent, emulsifying agent and water and optionally containing conventional additives such as tackifiers and extender oils, are provided for stabiliing loose soil formations, highway surfaces, railroad ballast, and the like.

3,645,948

AUTOMOTIVE CARPET BACKSIZING COMPOSITION

Roland E. Stahl, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation of abandoned application Ser. No. 707,985, Feb. 26, 1968. This application Nov. 9, 1970, Ser. No. 88,159

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 **4 Claims**

Automotive carpet backsizing compositions are disclosed which have superior adhesive properties and can be used to prepare carpets with improved shape retention. The compositions contain blends of particular ethylene/vinyl ester copolymers and microcrystalline or Fischer-Tropsch waxes having melting points of at least 165° F. and needle point penetration values of less than 10. Optionally, the compositions can contain a polyolefin such as polyethylene.

3,645,949

PROCESS FOR CONSTRUCTING TUFTED CARPETS AND RUGS AND BONDING AGENTS USEFUL THEREIN

Fred J. Crimi, Somerville, N.J., assignor to Union Carbide Corporation

Filed Apr. 4, 1968, Ser. No. 718,870

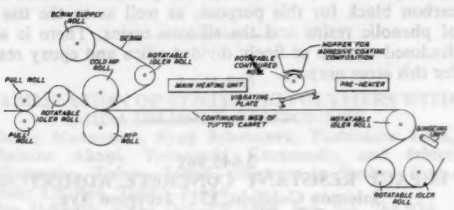
Int. Cl. C08f *29/12*

U.S. Cl. 260—28.5 **10 Claims**

Tufted carpets and rugs of fibrous strands are constructed by singeing the back of a tufted web, and preheating the back of the tufted web, applying a particulate bonding agent to the preheated web, heating the bonding agent above its fusion temperature and applying a pressure with cooling to force the bonding agent over the back of the tufted web and into the fibrous strands.

A novel composition utile as the bonding agent comprises a hydrocarbon polymer of a lower alkene, such

as polyethylene, having a melt index less than 150, an ethylene/mono-unsaturated ester copolymer having a melt



index greater than 100 and a wax having a melting point of from 75° to 95° C.

3,645,950

STABILIZATION OF POLY(ETHYLENE OXIDE)

J John Stratta, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,657
Int. Cl. C08f *45/56, 45/62;* C08g *51/56*
U.S. Cl. 260—29.2 3 Claims

Process for stabilizing aqueous solutions of poly(ethylene oxide) by incorporating a stabilizing amount of manganous ion in the aqueous solution.

3,645,951

CARPET BACKING ADHESIVE AND METHOD OF MAKING

Erich F. Kujas, Philadelphia, Pa., assignor to Prodesco, Inc., Perkasie, Pa.

No Drawing. Filed Oct. 6, 1969, Ser. No. 864,205
Int. Cl. C08g *37/32*
U.S. Cl. 260—29.4 UA 10 Claims

There is provided an adhesive composition for bonding carpeting yarns to the carpeting backing consisting essentially of hydroxy acrylic acid ester latex, melamine-formaldehyde condensate, dodecenyl succinic anhydride and zinc oxide in defined proportions. A method for making the adhesive composition, and its use, are also provided.

3,645,952

COMPOSITION FOR PAPER COATING AND PRODUCT FORMED THEREFROM

Martin K. Lindemann, Somerville, and Rocco P. Volpe, Newark, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Filed Mar. 31, 1965, Ser. No. 444,418
The portion of the term of the patent subsequent to Apr. 22, 1986, has been disclaimed
Int. Cl. C08f *45/24;* D21h *1/28*
U.S. Cl. 260—29.6 T 9 Claims

A coating composition effective to deposit upon a fibrous web, such as paper or paper board, a glossy, bright coating having desirable "pick" characteristics comprises an aqueous synthetic polymer latex and a mineral filler, the latex containing dispersed vinyl acetate-ethylene-glycidyl acrylate interpolymer of 5 to 40%, preferably more than 15%, ethylene content, the dispersed copolymer having a particle size of 0.1μ to 0.25μ, the latex preferably having a solids content of 35 to 70% of interpolymer and 100 parts of filler preferably being present per 5 to 25 parts of latex solids.

3,645,953

POLYMER LUBRICANT

Raymond R. Hindersinn, Lewiston, and Charles S. Ilardo, Tonawanda, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Nov. 7, 1969, Ser. No. 874,950
Int. Cl. C08k *1/40, 1/44*
U.S. Cl. 260—32.6 R 9 Claims

Compounds of the formula

$$N(CH_2CNHR)_3$$
$$\|$$
$$O$$

wherein R is alkyl of 12 to 30 carbon atoms are employed as lubricants for vinyl compositions.

3,645,954

CATIONIC THERMOSETTING RESIN

Yutaka Terada, Takatsuki-shi, Masanobu Urata, Osaka, and Kumeo Yamamoto, Kyoto, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Feb. 6, 1969, Ser. No. 797,230
Claims priority, application Japan, Feb. 10, 1968, 43/8,486
Int. Cl. C08g *20/20;* D21h *3/58*
U.S. Cl. 260—29.2 6 Claims

An aqueous cationic thermosetting resin solution is prepared by reacting an aliphatic dicarboxylic acid with a polyalkylenepolyamine, reacting the thus obtained polyamide intermediate with a lactam and further reacting an aqueous solution of the thus obtained block copolyamide with epichlorohydrin. The thus obtained resin solution is useful as an agent for improving a wet strength of paper, pigment retention aid and drainage improver, when applied to paper making, and further useful as a flocculant and shrink-proof agent.

3,645,955

PLASTICIZED, RADIOPAQUE VINYL RESIN COMPOSITIONS

Vincent J. Flynn, Tenafly, N.J., assignor to Scientific Tube Products, Inc., Englewood, N.J.

No Drawing. Continuation-in-part of application Ser. No. 826,778, May 6, 1969, which is a continuation-in-part of application Ser. No. 571,592, Aug. 10, 1966, now abandoned, which in turn is a continuation-in-part of application Ser. No. 518,186, Jan. 3, 1966, now abandoned. This application Mar. 18, 1970, Ser. No. 20,792
Int. Cl. C08f *45/40, 45/42*
U.S. Cl. 260—31.4 29 Claims

Novel plasticized, radiopaque compositions are provided by formulating vinyl resins with alkyl 2,5-diiodobenzoates, alkyl or alkoxyalkyl 2,3,4,6-tetraiodobenzoates (I), or mixtures thereof. The compositions are useful in the manufacture of X-ray opaque medical devices, particularly surgical tubing. The new compositions have improved radiopacity, lighter color and smoother surfaces after extrusion. When used singly or together, they have a wide range of flexibility and stiffness. Surgical tubing is provided in a wide range of sizes with properties essential to cardiovascular and ureteral catheterization techniques. The compositions are used also in tubing for stomach, nasal and thoracic catheters.

3,645,956

LIQUID MERCAPTO-TERMINATED POLYMER SEALANT COMPOSITIONS

John I. Doughty, White Bear Lake, and Philip G. Christman, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 15, 1967, Ser. No. 667,983
Int. Cl. C08g *43/00, 51/44*
U.S. Cl. 260—32.6 A 9 Claims

A one-part, can stable, mercapto-terminated polymer-based sealant containing ingredients which enhance the

transmission of moisture vapor through the sealant body to improve the cure rate. The ingredients include a latent oxidative curing agent, a latent hygroscopic accelerating agent, and a material which promotes the movement of water through the sealant matrix.

3,645,957

POLYAMIDES WITH A PIGMENT DISPERSED IN THE PRESENCE OF DIETHANOLAMIDE AND DIETHANOLAMINE

David James, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 7, 1969, Ser. No. 813,997
Claims priority, application Great Britain, Apr. 10, 1968, 17,274/68
Int. Cl. C08g *51/02, 51/44*
U.S. Cl. 260—32.6 N **18 Claims**

Polyamides having pigments dispersed therein in the presence of a diethanolamine and preferably in the presence of a diethanolamine and a diethanolamide.

3,645,958

METHOD OF MAKING SHAPED ARTICLES FROM FIBERS BONDED WITH OIL-RESISTANT SYNTHETIC RUBBER

Henry Joseph Palumbo, Middlesex, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

No Drawing. Filed May 20, 1968, Ser. No. 730,603
Int. Cl. C08c *11/22*
U.S. Cl. 260—33.6 A **7 Claims**

Shaped articles, such as sheets, made of fibers bonded together by an oil-resistant synthetic rubber, e.g., GRN rubber, are formed by working a dough containing the fibers and rubber into the required shape while evaporating solvent. The dough is prepared by mixing the fibers, plus other rubber compounding materials such as vulcanizing agents, with the oil-resistant rubber that has been previously solvated by soaking for at least several hours in an organic softening liquid diluent in which the rubber is at least substantially insoluble, and then working the mixture into a uniform softened mass by agitation. Sheets formed from the dough may typically be used for gaskets, flange packing, and the like.

3,645,959

PREPARATION OF HIGH MOLECULAR WEIGHT VINYL POLYMERS

Louis Anthony Pilato, Bound Brook, N.J., and Henry Octave Colomb, Jr., South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 5, 1970, Ser. No. 824
Int. Cl. C08f *45/28, 47/20*
U.S. Cl. 260—33.6 DA **15 Claims**

High molecular weight, non-aqueous dispersions, of such vinyl polymers as polyvinyl acetate, polyvinyl stearate, polyvinyl chloride, polyalkyl acrylates, polyalkyl methacrylates, and polystyrene have been prepared by copolymerizing the respective monomer with up to about one percent of a diene such as norbornadiene, ethylidene norbornene, the Diels-Alder reaction product of cyclopentadiene and norbornadiene, norbornadiene dimer and dicyclopentadiene.

3,645,960

POWDERED COATING COMPOSITIONS AND THE METHOD FOR THEIR APPLICATION

Laurence H. Haag, Reading, Pa., assignor to The Polymer Corporation, Reading, Pa.

No Drawing. Continuation-in-part of application Ser. No. 705,126, Dec. 26, 1957, now Patent No. 3,338,863. This application Aug. 7, 1967, Ser. No. 658,594
Int. Cl. C08f *51/04, 51/08*
U.S. Cl. 260—37 SB **5 Claims**

This application discloses a powdered coating composition characterized generally as being a dry blend of thermosetting film-forming resins suitable for forming a coating on an article by thermofusion with up to about 4% of a solid infusible material having an oil absorption value of at least 75 pounds per 100 pounds. Reference is made particularly to the use of synthetic silicates and carbon black for this purpose, as well as to the use of of phenolic resins and the silicone resins. There is also disclosed the use of finely divided silica and epoxy resins for this same purpose.

3,645,961

IMPACT RESISTANT CONCRETE ADMIXTURE

Solomon Goldfein, 1317 Jefferson Ave., Falls Church, Va. 22042

Continuation of application Ser. No. 425,367, Jan. 13, 1965. This application Dec. 5, 1967, Ser. No. 688,261
Int. Cl. C08f *45/16;* **C08g** *51/16*
U.S. Cl. 260—37 N **3 Claims**

The invention is an impact resistant concrete product comprising an admixture of inorganic hydraulic cement and selected aggregate, together with a plurality of selected fibers substantially uniformly distributed throughout said admixture.

3,645,962

FLAME RETARDANT POLYESTER COMPOSITIONS

Robert J. Schwarz, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Feb. 26, 1970, Ser. No. 14,679
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **6 Claims**

Linear saturated polyesters and particularly poly(ethylene terephthalate) with improved flame retardancy are provided which contain from 3 to 15% of a homopolyether or copolymer of an oxetane substituted in the three position by 1 or 2 bromomethyl groups or with from 1 to 15% of said polyether and from 0.5 to 5% of an antimony compound.

3,645,963

POLYMERS STABILIZED WITH POLYMETHYLENE SULFIDE

Adam F. Kopacki, Westwood, N.J., and Nathaniel L. Remes, Yonkers, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 684,946, Nov. 22, 1967. This application Jan. 19, 1970, Ser. No. 4,459
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.7 S **6 Claims**

A solid polymeric composition consisting essentially of a solid polymer selected from the class consisting of a hydrocarbon polymer, a substituted hydrocarbon polymer, a polyester, a vinyl polymer and copolymers and terpolymers thereof, stabilized against ultraviolet rays by incorporating therein a stabilizing quantity of a polyalkylene sulfide.

3,645,964

FIRE RETARDANT ACRYLONITRILE POLYMER COMPOSITIONS

Joseph di Pietro, Alma, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.

No Drawing. Filed July 16, 1969, Ser. No. 842,383
Int. Cl. C09k *3/28*
U.S. Cl. 260—45.7 P **3 Claims**

Films or fibers formed from an acrylonitrile polymer are rendered flame retardant by treating the polymeric

material with a chlorine-containing hydrocarbon such as a chlorine-containing alkyl phosphate or phosphonate, and a bromine-containing phosphate ester such as tris (2,3-dibromopropyl) phosphate, the molar proportion of Br to Cl in the treated polymer ranging from 3:1 to 1:3.

3,645,965

STABILIZATION OF SYNTHETIC POLYMERS WITH IMIDAZOLIDINE COMPOUNDS

Keisuke Murayama, Syoji Morimura, Toshimasa Toda, Saburo Akagi, Tomoyuki Kurumada, and Ichiro Watanabe, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

No Drawing. Filed Oct. 17, 1968, Ser. No. 768,974
Claims priority, application Japan, Oct. 23, 1967, 42/68,204; May 18, 1968, 43/33,429
Int. Cl. C08f *45/60*; C08g *51/60*
U.S. Cl. 260—45.8 N **4 Claims**

Synthetic polymers such as homopolymers of olefins, copolymers of olefines with other ethylenically unsaturated monomers, polyurethanes, polyamides, polyacetals, polyesters, polymerized vinyl monomers and the like are stabilized against photo- and thermal-deteriorations thereof by having incorporated therein an effective amount of one of the 2,5-tri- or tetrasubstituted-4-oxo (or thioxo)-imidazolidines. Among these imidazolidines, some of the 2,5-tri- or tetrasubstituted-4-oxo-imidazolidines are novel substances and other imidazolidines as such are disclosed in the prior art. These novel and old 2,5-tri- or tetrasubstituted-4-oxo-imidazolidines are prepared by a novel process which comprises (1) reacting the corresponding α-aminonitrile with an appropriate ketone or aldehyde in the presence of a basic catalyst or (2) reacting the corresponding α-aminonitrile with an appropriate ketone or aldehyde and then subjecting the intermediate Schiff base to the action of a basic catalyst.

3,645,966

STABILIZATION OF RUBBER

Allen K. Sparks, Des Plaines, and Edwin J. Latos, Chicago, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Original application Dec. 20, 1967, Ser. No. 691,963, now Patent No. 3,530,076, dated Sept. 22, 1970. Divided and this application Apr. 17, 1970, Ser. No. 29,649
Int. Cl. C08f *45/60*
U.S. Cl. 260—45.9 **8 Claims**

Stabilizing rubber against ozone cracking by incorporating therein a stabilizing concentration of a synergistic antiozonant mixture of from about 25% to about 75% by weight of N-isopropyl-N′-phenyl-p-phenylenediamine and correspondingly from about 75% to about 25% by weight of N,N′-di-sec-alkyl-p-phenylenedamine containing from 3 to 10 carbon atoms in each alkyl.

3,645,967

PHOTOCHROMIC COMPOUND

Walter Ried, Frankfurt am Main, and Arthur Heinrich Schmidt, Wiesbaden, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,130
Claims priority, application Germany, Nov. 21, 1969, P 19 58 485.1
Int. Cl. C07c *69/78*
U.S. Cl. 260—476 R **14 Claims**

This invention relates to novel photochromic compounds and to radiation-sensitive recording materials incorporating the said compounds.

3,645,968

SILICONE ELASTOMERS CONTAINING IRON COMPOUNDS AS STABILIZERS

Leslie Nathan Phillips, Farnborough, and David Kenneth Thomas, Farnham, England, assignors to National Research Development Corporation, London, England

No Drawing. Continuation-in-part of application Ser. No. 684,509, Nov. 20, 1967, which is a continuation-in-part of application Ser. No. 472,363, July 15, 1965. This application Apr. 28, 1970, Ser. No. 32,782
Claims priority, application Great Britain, July 15, 1964, 29,098/64
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 R **12 Claims**

Silicone elastomers are described which contain a hydrolytic degradation resistant additive which is an adduct or ferric chloride and an organic compound having three aromatic nuclei attached to one atom. Preferred adducts are those of ferric chloride with triphenylamine or with triphenyl carbinol and a convenient method of preparing the ferric chloride/triphenylamine adduct in solution is described.

The adducts of the present invention interfere with the cross-linking reaction of most curing agents but a class of curing agents, of which 2,5 - dimethyl-2,5-ditertiarybutyl peroxyhexane is the best member, which are not interfered with are disclosed.

3,645,969

CURABLE POLYEPOXIDE COMPOSITIONS CONTAINING AS A CURING AGENT A MIXTURE OF A POLYGLYCOL POLYAMINE AND AN ALKYLENE POLYAMINE

James R. Harvey, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed June 22, 1970, Ser. No. 48,471
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN **18 Claims**

This invention relates to curable polyepoxide compositions, containing as the curing agent a mixture of a polyglycol polyamine and an alkylene polyamine, which when used in the desired manner, as for example in coating, casting or filament winding applications to form articles of desired shape, and cured to infusible products, are characterized by excellent flexibility and toughness and by excellent surface characteristics.

3,645,970

BENZOATE HOMOPOLYMERS HINDERED PHENOLIC GROUPS AS STABILIZERS

Eduard Karl Kleiner, New York, N.Y., assignor to Ciba-Geigy Corporation

No Drawing. Continuation-in-part of application Ser. No. 738,770, June 2, 1968. This application Oct. 1, 1969, Ser. No. 862,934
Int. Cl. C08f *19/10*; C07c *69/76*
U.S. Cl. 260—47 U **2 Claims**

Benzoate monomers containing hindered phenolic groups are derived from α,β-unsaturated acids and benzoic acids containing hindered phenolic groups. The monomers are polymerized, by a free radical initiator yielding polymers which are stabilized of organic materials against degradation caused by oxidation and ultraviolet light. The polymeric stabilizers can be used alone or in combination with other stabilizers.

3,645,971

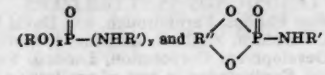
FIRE RETARDANT EPOXY RESINS CONTAINING PHOSPHORAMIDATES

Raymond R. Hindersinn, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Mar. 10, 1969, Ser. No. 805,865
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 CN **4 Claims**

There is provided a process for producing fire retardant epoxy resins which comprises curing a mixture of (1) an

epoxy resin and (2) a phosphoramidate of a formula selected from the group consisting of:



wherein R is alkyl, aryl, substituted alkyl or substituted aryl, R′ is hydrogen or R, R″ is hydrocarbylidene, x is 0 to 2, y is 1 to 3 and the sum of x and y is 3. An amine can be employed to improve the process.

3,645,972

NITRILOTRIACETIC ANHYDRIDE AS AN EPOXY RESIN CURING AGENT

Jack L. Herz, Scarsdale, and Edward D. Weil, Hastings-on-Hudson, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Oct. 27, 1969, Ser. No. 869,876
Int. Cl. C08g *30/12*
U.S. Cl. 260—47 CA **7 Claims**

Nitrilotriacetic anhydride is used to provide relatively low temperature curing (as compared with other anhydrides) of epoxy coatings or laminates. The cured epoxy resins thus obtained are characterized by good mechanical and electrical properties as well as dimensional stability and superior resistance to heat and chemicals. This unusual combination of properties make nitrilotriacetic anhydride an ideal candidate for such applications as curing epoxy resin formulations.

3,645,973

WATER-SOLUBLE SURFACE-ACTIVE CONDENSATION PRODUCTS [AND THE PRODUCTS THEREOF] FROM AMINOPLAST, ALCOHOL OR CARBOXYLIC ACID, POLYOL, AND SALT OF SULFUR CONTAINING ACID

Luzius Schibler, Riehen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Continuation of application Ser. No. 757,458, which is a continuation-in-part of application Ser. No. 527,491, Feb. 15, 1966. This application June 4, 1970, Ser. No. 41,773
Claims priority, application Switzerland, Mar. 9, 1965, 3,257/65
Int. Cl. C08g *9/24*
U.S. Cl. 260—67.6 R **7 Claims**

Water-soluble surface-active condensation products from aminoplast precondensates, containing radicals of mono-hydroxy compounds, radicals of alcohols containing at least 2 hydroxyl groups and Me—O_3S groups, where Me represents an alkali metal. These condensation products display a pronounced surface activity and act as lathering agents, detergents, emulsifiers and dispersants.

3,645,974

PIEZOELECTRIC CERAMIC COMPOSITIONS

Noboru Ichinose and Katsunori Yokoyama, Yokohama-shi, Harutoshi Egami, Tokyo, and Yoshikazu Tanno, Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Mar. 13, 1969, Ser. No. 806,944
Claims priority, application Japan, Mar. 15, 1968, 43/16,470
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 **1 Claim**

Piezoelectric ceramic compositions consisting essentially of a basic composition indicated by the formula:

$$x\mathrm{Pb(SbNb)_{0.5}O_3}—y\mathrm{PbTiO_3}—z\mathrm{PbZrO_3}$$

where:

x=0.5 to 25.0 mol percent
y=36.0 to 55.5 mol percent
z=53.5 to 20.5 mol percent
$x+y+z$=100 mol percent

and further containing at least one metal oxide selected from the group consisting of ThO_2 and CeO_2 in an amount of from 0.1 to 3 percent by weight based upon the basic composition.

3,645,975

METHOD OF PREPARING SOLID POLYURETHANE ELASTOMERS

Carl Bernstein, Deerfield, Ill., assignor to Witco Chemical Corporation, New York, N.Y.

Filed Apr. 8, 1968, Ser. No. 719,415
Int. Cl. B65b *11/00*; C08g *53/00*
U.S. Cl. 260—75 NE **10 Claims**

Unvulcanized, solid polyurethane elastomers are prepared by reacting an admixture of active-hydrogen-containing linear polyether or polyester polymers or branched-chain derivatives thereof, organic diisocyanates, and such other ingredients as may be required, such as chain-extenders, in a thin-walled, preformed polyethylene reaction container at a temperature from about 125 to 300 degrees F., the reaction mixture advantageously being protected from contact with the atmosphere until a solid polymer is formed. The plastic reaction vessel can be readily cut and stripped from the surface of the solid elastomer or the solid elastomer can be stored or shipped while still encased in the plastic reaction vessel.

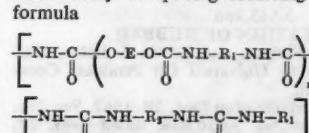
3,645,976

ELASTIC POLYURETHANE FIBERS

Isamu Suzuki, Kiyoshi Ichikawa, Yasuji Nakahara, and Kunico Kondo, Fuji-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Oct. 29, 1969, Ser. No. 872,390
Claims priority, application Japan, Nov. 5, 1968, 43/80,831; May 21, 1969, 44/38,717
Int. Cl. C08g *22/04, 22/18*
U.S. Cl. 260—75NH **4 Claims**

In the segment polyurethane polymers consisting as the main components of bifunctional low polymeric compounds having terminal active hydrogen atoms, organic diisocyanates and diamines, elastic polyurethane fibers substantially comprising recurring units of the general formula



wherein E is a radical of bifunctional low polymeric compounds having terminal active hydrogen atoms; R_1 is a member selected from the group consisting of 4,4′-methylenebiscyclohexyl, 4,4′-isopropylidenebiscyclohexyl, 4,4′-oxybiscyclohexyl and 1,4-cyclohexylene radicals; R_2 is a member selected from the group consisting of 1,4-cyclohexylene radicals with or without methyl and ethyl groups on the ring; m is from 0 to 2; and n and q are 1 or 2 respectively, and in which at least 50 percent by weight of R_1 has trans-trans conformation except the case where R_1 is 1,4-cyclohexylene in which at least 55 percent by weight has trans conformation and at least 33 percent by weight of R_2 has trans conformation.

3,645,977

ACRYLATE-ACRYLIC ACID-N-VINYL URETHANE TERPOLYMERS

Larry G. Wolgemuth, Cherry Hill, N.J., and William H. Fritock, Glenolden, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,855
Int. Cl. C08f *15/40*
U.S. Cl. 260—77.5 BB **14 Claims**

Heat-curable terpolymers comprising the residues of an acrylate, an acrylate acid and an N-vinyl urethane are

ides, ureas or melamines. These thermosetting coatings baking with various cross-linking agents such as epoxides, ureas or melamines. These thermosetting coatings may be incorporated into paint coating systems, electrocoating systems, fibers and adhesives.

3,645,978
POLYIMINOHYDANTOINS AND METHOD OF PREPARATION
James M. Craven, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington Del.
No Drawing. Filed Aug. 26, 1970, Ser. No. 71,287
Int. Cl. C08g *33/02*
U.S. Cl. 260—77.5 CH 6 Claims

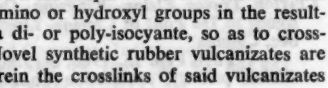
A novel polyiminohydantoin composition which is the reaction product of a multifunctional isocyanate and a multifunctional cyanomethylamine said polymer having utility as high temperature adhesives structural laminates and as binders for laminated circuit boards.

3,645,979
PROCESS FOR COPOLYMERIZATION OF AROMATIC AND ALIPHATIC POLYISOCYANATES TO FORM POLYISOCYANURATES
Dietrich Liebsch, Leverkusen, and Wilhelm Altner, Burscheid, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Jan. 25, 1967, Ser. No. 611,693
Claims priority, application Germany, Feb. 2, 1966, F 48,322
Int. Cl. C08g *22/04, 22/26;* C07d *55/38*
U.S. Cl. 260—77.5 NC 7 Claims

A method for preparing polyisocyanates having at least one isocyanurate ring which comprises polymerizing an aromatic and an aliphatic or araliphatic polyisocyanate in the presence of an organic phosphine, the aliphatic or araliphatic polyisocyanate being present in such an amount that more than about 0.5 aliphatically bound —NCO group is present per aromatically bound —NCO group, preferably 0.5 to 10. The products per se have utility as adhesives, lacquers, casting resins, and foams, and also as the isocyanate component in other reactive systems.

3,645,980
VULCANIZATION OF RUBBER
Crispin Stuart Leworthy Baker, Stapleford, Douglas Barnard, Welwyn Garden City, and Maurice Read Porter, Stevenage, England, assignors to The Natural Rubber Producers' Research Association, London, England
No Drawing. Filed Sept. 30, 1969, Ser. No. 862,507
Claims priority, application Great Britain, Oct. 4, 1968, 47,289/68
Int. Cl. C08g *22/08*
U.S. Cl. 260—77.5 CR 10 Claims

The present invention relates to a novel method of crosslinking natural or synthetic rubbers which comprises reacting rubber with a nitrosophenol or nitrosoamine and reacting pendent amino or hydroxyl groups in the resulting product with a di- or poly-isocyante, so as to crosslink the rubber. Novel synthetic rubber vulcanizates are also provided wherein the crosslinks of said vulcanizates have the general formula:



wherein R represents a rubber molecule, Ar is an aromatic group, Y is an oxygen atom or a substituted or unsubstituted —NH— group, and Q is an organic difunctional group.

3,645,981
PROCESS FOR PREPARING POLYTHIOUREAS
Willard Hallam Bonner, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Oct. 27, 1969, Ser. No. 869,869
Int. Cl. C08g *22/02*
U.S. Cl. 260—77.5 CH 13 Claims

Polythioureas are prepared by the solution polymerization of suitable aliphatic and/or alicyclic diamines and carbon disulfide in specified solvents within a controlled temperature range. In this process, shorter reaction times than are required in known processes, provide high molecular weight polymer.

3,645,982
SYNTHESIS OF POLY(ALLYL URETHANES)
Donald W. Larsen, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Nov. 24, 1969, Ser. No. 879,537
Int. Cl. C08g *22/06*
U.S. Cl. 260—77.5 BB 4 Claims

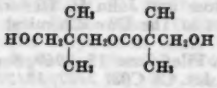
Allyl urethane is formed by reacting a solution of an allyl halide, an alkali metal cyanate and a polyol. The allyl urethanes are useful in the preparation of photocurable liquid polymers, that are photocured by the free radical addition of thiol groups of polythiols to the allyl double bonds.

3,645,983
COPOLYAMIDES FROM 3-(4-CARBOXYPHENYL)-1,1,3-TRIMETHYL-5-INDAN CARBOXYLIC ACID AND BIS(BETA - AMINOETHYL)BENZENE OR -DURENE
James S. Ridgway, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Nov. 29, 1968, Ser. No. 780,279
The portion of the term of the patent subsequent to Apr. 25, 1985, has been disclaimed
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R 1 Claim

Copolyamides are prepared by polymerizing adipic acid, hexamethylene diamine, 3-(4-carboxyphenyl)-1,1,3-trimethyl-5-indan carboxylic acid and bis(beta-aminoethyl) benzene or bis(beta-aminoethyl)durene. Filaments made from such copolyamides are useful in reinforcing rubber articles such as pneumatic tires.

3,645,984
NOVEL ACRYLIC MONOMERS, THEIR PREPARATION AND TREATMENT
Rostyslaw Dowbenko and Roger M. Christenson, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Filed Apr. 30, 1969, Ser. No. 820,672
Int. Cl. C08f *3/50;* C07c *69/52*
U.S. Cl. 260—78.4 23 Claims

A novel acrylic monomer is prepared by reacting a diol such as



with a acrylic or methacrylic acid or their anhydrides or acid chlorides. The reaction product is a monomer which may be polymerized by subjecting it to ionizing irradiation, actinic light, or to free-radical catalysts, and the resulting polymer is a hard, mar-resistant material.

3,645,985

POLYMERS OF 5-(3-PERFLUOROALKYL-1,2,4-OXADIAZOLYL) OLEFINS

Pier Luigi Pacini, Bruxelles, Belgium, and Eduard Karl Kleiner, New York, N.Y., assignors to Ciba-Geigy Corporation.

No Drawing. Filed June 16, 1969, Ser. No. 833,706
Int. Cl. C08f *3/42, 19/00*
U.S. Cl. 260—78.4 R 21 Claims

Monomeric 5-(3-perfluoroalkyl-1,2,4-oxadiazolyl) olefins form homopolymers and copolymers with other ethylenically unsaturated comonomers. The polymers obtained have valuable soil repellent and dyesite properties which are especially useful in textile finishes. Preferred compounds exemplified are 1,2-bis[5-(3-n-perfluoroheptyl-1,2,4-oxadiazolyl)]ethylene and 5-isopropenyl-3-n-perfluoroheptyl-1,2,4-oxadiazole.

3,645,986

ELECTRO-INITIATED POLYMERIZATION HETEROCYCLIC MONOMERS

Mahmoud R. Rifi, Kendall Park, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 875,437, Nov. 10, 1969. This application Apr. 9, 1970, Ser. No. 27,160.
Int. Cl. C08g *23/02, 23/14*
U.S. Cl. 260—79 10 Claims

Electro-initiated polymerization of heterocyclic monomers including cyclic ethers, sulfides, cyclic esters and cyclic amines has been effected by generating a cationic catalyst electrochemically from one of the monomers itself in the presence of a supporting electrolyte in an anolyte compartment and then adding this catalyst to a monomer optionally containing an organic diol, triol, or polyol as a starter or polymerization regulator.

3,645,987

N-AZOLYL SULFENAMIDES

Joseph Edward Kerwood, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 25, 1969, Ser. No. 861,152
Int. Cl. C07d *85/00, 91/46;* C08f *27/06*
U.S. Cl. 260—79.5 B 8 Claims

Sulfenamides of the formula

$$T-\underset{\displaystyle R'}{\underset{|}{N}}-S-R$$

wherein R is alkyl, cycloalkyl, aralkyl, substituted aralkyl, aryl, or substituted aryl, where the substituents are alkyl, alkoxy, nitro, chloro, bromo, fluoro, iodo or hydroxy, R′ is hydrogen or R″S— where R″ has the same meaning as R and may be the same or different from R, T is azolyl or substituted azolyl selected from the group of thiazolyl, benzothiazolyl, benzoxazolyl, benzimidazolyl and substituted derivatives thereof, where the substituents are lower alkyl, chloro, bromo, fluoro, iodo, nitro or lower alkoxy are premature vulcanization inhibitors of vulcanizable elastomers.

3,645,988

PYRIDYL ACRYLATES AND METHACRYLATES AND DYEABLE ACRYLONITRILE COPOLYMERS PREPARED THEREFROM

Gary G. Hammer and John H. Hennes, Williamsburg, Va., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 17, 1969, Ser No. 834,159
Int. Cl. C08f *7/12, 15/22*
U.S. Cl. 260—80.72 7 Claims

Pyridyl acrylates or methacrylates are prepared by reacting the sodium salt of a hydroxy substituted pyridine with acrylyl or methacrylyl chloride. Copolymerization of small amounts of the resulting monomer (e.g. 1–10%) with a major proportion (e.g. 85–99%) of acrylonitrile, optionally containing up to about 10% of another copolymerizable monomer (e.g. methyl acrylate) and spinning, results in fibers having excellent dyeability and heat stability.

3,645,989

FLUORINATED OIL- AND WATER-REPELLENT AND DRY SOIL RESISTANT POLYMERS

Thomas King Tandy, Jr., Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 29, 1970, Ser. No. 6,961
Int. Cl. C08f *15/24, 15/40*
U.S. Cl. 260—80.73 11 Claims

Fluorinated oil- and water-repellent and dry soil resistant polymers containing units derived from monomers having the structure $R_fCH_2CH_2O_2CCH{=}CH_2$ wherein R_f is a perfluoroalkyl group of about 4 through 14 carbon atoms, and methyl acrylate or ethyl acrylate, and optionally containing small amounts of units derived from monomers selected from $CH_2{=}CRCONHCH_2OH$, $CH{=}CRCO_2CH_2CH_2OH$ and mixtures thereof wherein R is H or CH_3.

3,645,990

FLUORINATED OIL- AND WATER-REPELLENT AND DRY SOIL RESISTANT POLYMERS

Stuart Raynolds, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 29, 1970, Ser. No. 6,962
Int. Cl. C08f *15/18, 15/40*
U.S. Cl. 260—80.73 8 Claims

Fluorinated oil- and water-repellent and dry soil resistant aqueous emulsion polymers containing units derived from monomers having the structure

$$R_fCH_2CH_2O_2CC(CH_3){=}CH_2$$

wherein R_f is a perfluoroalkyl group of about 4 through 14 carbon atoms, and methyl acrylate or ethyl acrylate, and optionally containing small amounts of units derived from monomers selected from $CH_2{=}CRCONHCH_2OH$, $CH{=}CRCO_2CH_2{-}CH_2OH$ and mixtures thereof wherein R is H or CH_3.

3,645,991

VINYLIDENE FLUORIDE COPOLYMERS HAVING IMPROVED RESISTANCE TO HEAT-AGING

Arthur Nersasian, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 2, 1970, Ser. No. 25,286
Int. Cl. C08f *1/62*
U.S. Cl. 260—80.77 6 Claims

Vinylidene fluoride copolymers having improved resistance to heat-aging are prepared by polymerization in an aqueous medium in the presence of a catalyst system of (a) a water-soluble inorganic peroxy compound capable of initiating polymerization of the monomers, and (b) a water-soluble hypophosphite.

3,645,992

PROCESS FOR PREPARATION OF HOMOGENOUS RANDOM PARTLY CRYSTALLINE COPOLYMERS OF ETHYLENE WITH OTHER ALPHA-OLEFINS

Clayton Trevor Elston, Kingston, Ontario, Canada, assignor to Du Pont of Canada, Limited, Montreal, Quebec, Canada

Filed Feb. 15, 1968, Ser. No. 705,701
Claims priority, application Canada, Mar. 2, 1967, 984,213
Int. Cl. C08f *15/04*
U.S. Cl. 260—80.78 13 Claims

Preparation of copolymers of ethylene and an alpha olefin having at least four carbon atoms using an inert solvent and a catalyst formed using particular ratios of an aluminum halide and a vanadium compound.

3,645,993

INTERPOLYMERIZATION OF A MIXTURE OF MONOOLEFINS AND A POLYENE IN THE PRESENCE OF A BASE AND A HALOGENATED COMPOUND

Ronald H. Sunseri, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Coorporation

No Drawing. Continuation-in-part of application Ser. No. 701,852, Jan. 31, 1968, which is a continuation-in-part of application Ser. No. 622,888, Mar. 4, 1967. This application June 16, 1969, Ser. No. 833,695

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.78 35 Claims

Sulfur vulcanizable elastomers which are substantially free of gel are prepared in solution in an organic solvent from a monomeric mixture including ethylene, an alpha-monoolefin containing 3–16 carbon atoms and a polyunsaturated monomer in the presence of a Ziegler-type polymerization catalyst, and a synergistic combination of certain bases and a halogenated organic compound.

3,645,994

PROCESS FOR HYDROGENATION OF AROMATIC HYDROCARBONS

Lloyd M. Watson and William R. Birchall, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Original application Aug. 18, 1967, Ser. No. 661,538. Divided and this application May 21, 1970, Ser. No. 48,597

Int. Cl. C08d *3/04, 3/06;* C08f *7/02*

U.S. Cl. 260—82.1 5 Claims

A process is provided for the hydrogenation of aromatic hydrocarbons having a naphthalene nucleus, using metallic sodium and a lower aliphatic alcohol as the source of hydrogen, employing sodium with an average particle size within the range from about 0.5 to about 50 microns, dispersed in an inert diluent.

A process is also provided for the preparation of alfin polymers by polymerization of an unsaturated organic compound in the presence of an alfin catalyst, employing as the molecular weight modifier the crude dihydronaphthalene dissolved in an inert diluent that is obtained in this by hydrogenation.

3,645,995

POLYMERIZATION PROCESS

Anthony David Caunt, Welwyn Garden City, England, assignor to Imperial Chemical Industries, Limited, London, England

No Drawing. Filed Jan. 16, 1969, Ser. No. 791,783

Claims priority, application Great Britain, Jan. 29, 1968, 4,497/68

Int. Cl. C08f *1/56, 3/02*

U.S. Cl. 260—88.2 5 Claims

Olefines of 5 or more carbon atoms are polymerized using a catalyst of titanium trichloride/organometallic activator. The titanium trichloride component of the catalyst is prepared by the reduction of titanium tetrachloride with a high aluminum alkyl compound, particularly isobutyl aluminum sequichloride.

3,645,996

RESINS USEFUL IN PEPTIDE SYNTHESIS

George Lee Southard, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Mar. 10, 1969, Ser. No. 805,884

Int. Cl. C08f *15/00, 15/04*

U.S. Cl. 260—88.2 C 1 Claim

A benzyl styrene-divinylbenzene copolymer useful as an ester-forming C-protecting group in solid-phase peptide synthesis; used in conjunction with easily hydrolyzed N-protecting groups, preferably the enamine derivative prepared from β-dicarbonyl compounds; the benzyl styrene-divinylbenzene copolymer being readily removable, after peptide formation, with dilute acids in non-aqueous solvents at room temperature.

3,645,997

CHELATING COMPOSITIONS

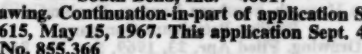
Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

No Drawing. Continuation-in-part of application Ser. No. 638,615, May 15, 1967. This application Sept. 4, 1969, Ser. No. 855,366

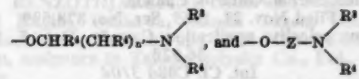
Int. Cl. C08f *7/12, 19/20*

U.S. Cl. 260—88.1 19 Claims

New triazine compounds are disclosed having attached to the three valencies of the symmetrical triazine nucleus at least one A′ group containing a terminal polymerizable $CH_2{=}C<$ group and at least one chelating T group of the class:



and



wherein each of the symbols, R^1, R^2 and R^3 individually represents a radical selected from the class of —H, —CHR^4COOM and a hydrocarbon radical containing 1–6 carbon atoms and wherein at least one of the radicals represented by R^1, R^2 and R^3 contains a carboxyl group, M is a member consisting of hydrogen, ammonium bases and metals, and R^4 represents a radical selected from the class consisting of hydrogen and a hydrocarbon radical containing 1–6 carbon atoms, *n′* represents an integer of 1–6 and —Z— is a divalent hydrocarbon radical containing 6–12 carbon atoms. These compounds are useful as chelating compositions particularly for the removal of metal from solutions of metal compounds.

3,645,998

METHOD OF PRODUCING POLYVINYL FLUORIDE IN AN AQUEOUS MEDIUM IN THE PRESENCE OF A CATALYST SYSTEM OF TRI-ALKYL BORON AND HYDROGEN PEROXIDE

Yuichi Iikubo, Takuji Nishida, and Yoshiki Furukawa, Onoda, Japan, assignors to Onoda Cement Company, Limited, Yamaguchi Prefecture, Japan

Filed Apr. 16, 1969, Ser. No. 816,678

Claims priority, application Japan, May 8, 1968, 43/30,256

Int. Cl. C08f *3/22*

U.S. Cl. 260—92.1 11 Claims

This invention relates to a method of producing polyvinyl fluoride by polymerizing a monomer of vinyl fluoride in an aqueous medium by using a catalyst comprising trialkyl-boron and hydrogen peroxide for initiating the polymerization of said monomer. The polymerization reaction is easily started in the aqueous medium due to the actions of the special catalyst and the characteristics of the resultant polyvinyl fluoride can easily be controlled.

3,645,999

POLYMERIC MATERIALS

Norman R. Byrd, Dana Point, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Continuation of application Ser. No. 486,833, Sept. 13, 1965. This application Oct. 23, 1969, Ser. No. 872,440

Int. Cl. C08f *7/04;* H01b *1/06*

U.S. Cl. 260—93.5 2 Claims

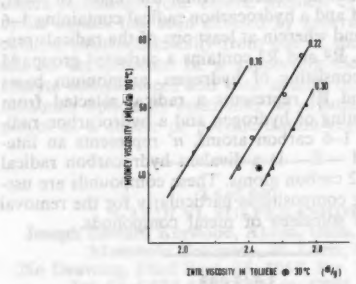
Poly(ring substituted-phenyl acetylene), where the ring substitution can be selected from one or more of nitro, amino, alkoxy, alkyl, alkylthio, hydroxyl, carboxyl, acyl,

mercapto, cyano, halogeno, vinyl, and heterocyclic radicals, and copolymers thereof with olefinically unsaturated monomers are prepared. The polymers have great utility as semiconductors, primarily for use as detectors for polar and/or non-polar materials, in selective fashion.

3,646,000
POLYMERIZATION CATALYST
Bertalan Horvath, Southern London, England, assignor to Phillips Petroleum Company
No Drawing. Filed Apr. 23, 1969, Ser. No. 818,805
Int. Cl. C08f *3/02, 3/04, 3/08*
U.S. Cl. 260—93.7 **1 Claim**

An olefin polymerization process employing a reduced titanium oxide catalyst on a silica support in the presence of an organoaluminum halide, which produces particle-form polymer having molecular weights greater than a million.

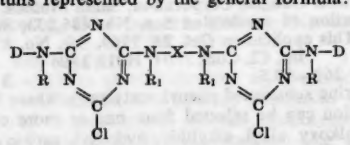
3,646,001
LINEAR POLYMERS OF BUTADIENE
Evalds Lasis and Nathan John McCracken, Sarnia, Ontario, Canada, assignors to Polymer Corporation Limited, Sarnia, Ontario, Canada
Filed Nov. 21, 1969, Ser. No. 878,599
Claims priority, application Canada, Dec. 5, 1968, 36,920
Int. Cl. C08d *3/04*
U.S. Cl. 260—94.3 **8 Claims**



Polymers of butadiene-1,3 of a predetermined linearity and having more than 95% of the butadiene units in the cis-1,4 configuration are prepared by polymerizing butadiene-1,3 in the presence of a soluble catalyst comprising a Group VIII metal compound, preferably a cobalt compound, organoaluminum compound and water. The Group VIII metal compound and water, both dissolved in an inert organic liquid, are mixed preferably prior to the addition of the aluminum compound, the aluminum compound is then admixed in the absence of butadiene-1,3 and the mixture is reacted and, if desired, stored at a temperature not more than about 20° C.

3,646,002
COPPER CONTAINING DISAZO TRIAZINE DYES
Herbert Francis Andrew and Robert Higginbottom, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Jan. 12, 1970, Ser. No. 2,389
Claims priority, application Great Britain, Jan. 16, 1969, 2,663/69
Int. Cl. C09b *62/08*
U.S. Cl. 260—146 T **6 Claims**

Dyestuffs represented by the general formula:

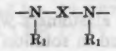


wherein

D represents a radical of a monoazo compound which contains at least one SO_3H group and which contains a heavy metal atom in the form of a metal complex,

either R and R_1 represent H or saturated aliphatic radicals having up to 4 carbon atoms, and

X represents a benzene, diphenylene or naphthalene nucleus which may contain substituents, or an aliphatic radical having at least 2 carbon atoms, or



represents 1,4-piperazinylene

are useful reactive dyestuffs for cellulose textile materials giving a wide range of shades of excellent fastness to washing. They are notable for the high proportion which fixes on the material, especially when applied from saline dyebaths.

3,646,003
COPOLYMERIZABLE (ALKOXYCARBONYLPHENYLAZO) PHTHALOCYANINE DYESTUFFS
Bernard Lamure, Lyon, France, assignor to Societe Rhodiaceta, Paris, France
No Drawing. Filed Mar. 28, 1969, Ser. No. 811,587
Claims priority, application France, Mar. 29, 1968, 146,473
Int. Cl. C09b *43/00, 47/04*; D06p *3/00*
U.S. Cl. 260—146 **3 Claims**

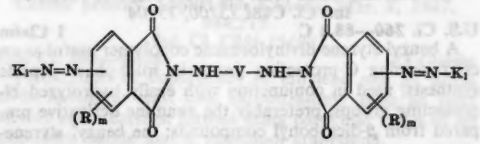
Phthalocyanine dyestuffs of excellent fastness to light and solvents, which are particularly useful for colouring polyesters and polyamides in green and blue shades, have the formula:

$$Pc—[—D—Ar(COOR)_n]_p$$

where Pc is a phthalocyanine nucleus, D is —O—, —S—, alkylene, —CO—, or —N=N—, Ar is an aromatic radical, R is hydrogen atom or a hydrocarbon radical and *n* and *p* are each 1 to 4.

3,646,004
BIS-(N-ACYLAMINO-PHTHALIMIDE)-DISAZO DYESTUFFS
Walter Horstmann, Cologne, Dietmar Kalz, Leverkusen, Gerhard Wolfrum, Opladen, and Edgar Siegel, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Nov. 26, 1968, Ser. No. 779,226
Claims priority, application Germany, Dec. 6, 1967, P 16 44 237.8; Apr. 4, 1968, P 17 69 105.3
Int. Cl. C09b *33/02*
U.S. Cl. 260—152 **5 Claims**

Azo dyestuffs free from sulfonic acid groups are prepared which are valuable new pigment dyestuffs characterized by good fastness to light, solvents and migration, and by a good thermal stability adapted for use in coloring papers, lacquers, and synthetic materials and for producing pigment paste and printing inks. The dyestuffs correspond to the general formula



where V stands for a radical —OC—B—CO— or a radical

where B denotes a direct bond, an optionally substituted aliphatic, araliphatic, carbocyclic or heterocyclic radical, X stands for NH, O or S; K_1 denotes the radical of a monofunctional coupling component; R stands for identical or different substituents; and *m* is an integer from 0 to 3.

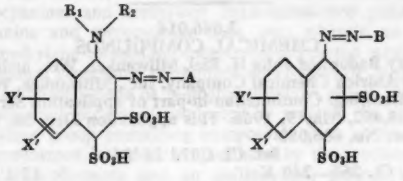
3,646,005

POLYNUCLEAR AMINES AND PROCESS FOR THE PREPARATION THEREOF

Rene Pierre Victor Roe, Seine Inferieure, and Gerard Thirot, Petit-Quevilly, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Mar. 10, 1967, Ser. No. 622,109
Claims priority, application France Mar. 29, 1966, 55,303
Int. Cl. C07c *143/60, 143/66*
U.S. Cl. 260—508 10 Claims

The present invention relates to a process for the sulphonation of an aromatic or heterocyclic polynuclear amine which comprises treating the amine, dispersed or dissolved in an aqueous solution of a water-soluble salt of sulphurous acid, with an oxidising agent of which the oxidation potential, measured at 20° C. and pH 7 with respect to the normal hydrogen electrode, is between +0.4 and +0.7 volt, the pH of the medium being maintained approximately constant at a value between 3 and 9.5. It also relates to new sulphonated polynuclear amines and to azo dyestuffs having one of the formulae:



wherein A represents the residue of a diazotisable aromatic or heterocyclic amine, B represents the residue of a coupling compound, R_1 represents a hydrogen atom or an alkyl or aryl residue, R_2 represents a hydrogen atom or an alkyl residue, and X' and Y' each represent hydrogen or halogen atoms or hydroxy, alkoxy, carboxy, sulpho or

groups.

3,646,006

CRYSTALLIZATION PROCESS

Frank Whitley Lord, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,982
Claims priority, application Great Britain, Oct. 16, 1967, 47,076/67
Int. Cl. C07c *47/18*
U.S. Cl. 260—209 R 9 Claims

Supercooled liquid organic materials are induced to crystallize by dispersing fine bubbles of gas or liquid throughout the liquid material.

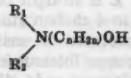
3,646,007

COMPLEX OF INOSINE WITH DIALKYLAMINOALKANOL

Paul Gordon, Chicago, Ill., assignor to Newport Pharmaceuticals, Inc.

Filed Aug. 28, 1969, Ser. No. 853,864
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R 16 Claims

Complexes are formed in inosine and aminoalcohols of the formula



where R_1 and R_2 are lower alkyl and *n* is an integer of 2 to 4. The complexes have pharmacological activity including the ability to restore deteriorated learning and memory behavior. The preferred aminoalcohol is dimethylamino isopropanol. The preferred ratio of inosine to aminoalcohol is 1:3.

3,646,008

BENZOTHIAZEPINE DERIVATIVES

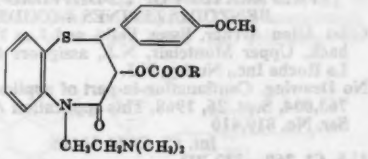
Hiroshi Kugita, Osaka-fu, Satoshi Takeo, Omiya-shi, Masanori Sato, Toda-shi, and Taku Nagao, Omiya-shi, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,897
Claims priority, application Japan, Jan. 25, 1969, 44/5,493
Int. Cl. C07d *43/40*
U.S. Cl. 260—239.3 3 Claims

2-(4-methoxyphenyl)-3-hydroxy-5-(β-dimethylaminoethyl) - 2,3 - dihydro - 1,5 - benzothiazepin-4(5H)-one is reacted with a lower alkyl haloformate having the formula

X·COOR

wherein X is a halogen atom and R is a lower alkyl radical. The reaction is conducted in the presence of a base. A benzothiazepine derivative having the formula



wherein R is as defined above, is produced. The benzothiazepine derivative and its pharmaceutically acceptable acid addition salts are useful as coronary vasodilators.

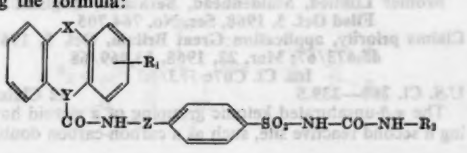
3,646,009

ANTI-DIABETICALLY ACTIVE SULFONYL-SEMICARBAZIDES

Werner Winter, Mannheim, Erich Fauland and Kurt Stach, Mannheim-Waldhof, Felix Helmut Schmidt, Mannheim-Neuostheim and Walter Aumüller, Kelkheim/Munster, Germany, assignors to C. F. Boehringer & Soehne G.m.b.H., Mannheim-Waldhof, Germany

No Drawing. Filed Mar. 11, 1968, Ser. No. 711,840
Claims priority, application Germany, Mar. 15, 1967, B 91,627
Int. Cl. C07d *29/12*
U.S. Cl. 260—239 6 Claims

Novel sulfonyl ureas and sulfonyl-semicarbazides having the formula:



wherein X represents oxygen, sulfur, saturated, unsaturated, straight or branched chain alkylene containing up to 3 carbon atoms, oxymethylene, thiamethylene, thiaethylene, iminomethylene, alkylated iminomethylene, acylated iminomethylene, carboximido, alkylated carboximido, or a valency bond, R_1 is hydrogen, halogen, alkyl, alkoxy or trifluoromethyl, Y is saturated, unsaturated, straight or branched chain alkylene containing up to 6 carbon atoms or such alkylene group containing a nitrogen or oxygen atom, Z is straight or branched chain alkylene containing up to 4 carbon atoms and R_2 is straight or branched chain, saturated or unsaturated alkyl or cycloalkyl, and such groups interrupted by oxygen or sulfur atoms or containing an endo-alkylene group, substituted or unsubstituted aryl or aralkyl or substituted, unsubstituted, saturated or unsaturated alkylene-imino containing 3 to 7 carbon atoms or such alkylene-imino containing an endo-alkylene group.

The aforesaid sulfonyl ureas and sulfonyl-semicarazides constitute extremely effective anti-diabetic agents.

3,646,010
SPIROAZETIDINE-ETHANOANTHRACENES
Gilbert H. Berezin, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 726,542, May 3, 1968. This application Apr. 2, 1969, Ser. No. 812,846
Int. Cl. C07d *25/00, 99/04*
U.S. Cl. 260—239 A **10 Claims**

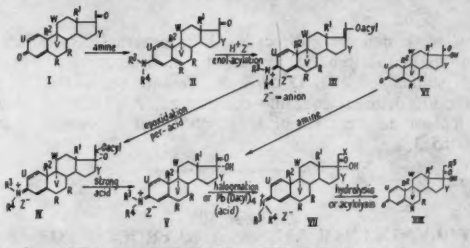
This disclosure teaches that a group of spiroazetidine-ethanoanthracenes are useful as pharmaceutical agents. The disclosure also teaches a method for combatting inflammation by administering pharmaceutical formulations of the compounds of this invention. Representative compounds of this invention include compounds such as 9',10'-dihydrospiro[azetidine-3,11'-9,10-ethanoanthracene] and derivatives thereof.

3,464,011
PREPARATION OF 2,3-DIHYDRO-1H-1,4-BENZODIAZEPINES 4-OXIDES
Giles Allan Archer, Essex Fells, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Continuation-in-part of application Ser. No. 763,004, Sept. 26, 1968. This application Apr. 25, 1969, Ser. No. 819,410
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD **5 Claims**

2,3-dihydro-1H-1,4-benzodiazepine 4-oxides are prepared from correspondingly substituted 2-(2-A-ethyl lower alkylamino)benzophenone, where A is a leaving group, by treatment of the latter compounds with hydroxylamine hydrochloride. Alternatively, the aforesaid compounds may be obtained by cyclization of 2-(2-A-ethyl lower alkylamino)benzophenone oximes. The 2,3-dihydro-1H-1,4-benzodiazepine 4-oxides are useful as intermediates in the preparation of pharmacologically active 2,3-dihydro-1H-1,4-benzodiazepines by deoxygenation of the former compounds.

3,646,012
ENAMINE SALT PROTECTION OF STEROIDAL α,β-UNSATURATED KETONES
Brian Gadsby, Maidenhead, England, and Michael R. G. Leeming, Broomall, Pa., assignors to John Wyeth & Brother Limited, Maidenhead, Berkshire, England
Filed Oct. 3, 1968, Ser. No. 764,705
Claims priority, application Great Britain, Oct. 5, 1967, 45,473/67; Mar. 22, 1968, 13,969/68
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.5 **12 Claims**

The α,β-unsaturated ketonic grouping of a steroid having a second reactive site, such as a carbon-carbon double or triple bond or an enolizable ketonic group, is protected by formation of an eniminium salt. The resulting salt is then treated under neutral or acidic conditions with an electrophilic reagent reactive with said second reactive



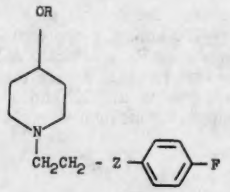
site by addition or substitution. Thereafter, the free α,β-unsaturated ketonic grouping is regenerated by alkaline hydrolysis, and a steroid modified by electrophilic reaction at said second reactive site is recovered.

3,646,013
PROCESS FOR THE PREPARATION OF ALDOSTERONE 21-ESTERS
Alberto Ercoli, Milan, Rinaldo Gardi, Carate Brianza, and Romano Vitali, Casatenovo, Italy, assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.
No Drawing. Filed Feb. 16, 1970, Ser. No. 11,909
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 **5 Claims**

A process for the preparation of aldosterone 21-esters in which a corresponding 18-ester -21-acetate of aldosterone is subjected to basic solvolysis: by detachment of the 21-acetate ester and following migration of the esters in 18-position towards 21-position the final aldosterone 21-esters are obtained.

3,646,014
CHEMICAL COMPOUNDS
Henry Bader and John H. Biel, Milwaukee, Wis., assignors to Aldrich Chemical Company, Inc., Milwaukee, Wis.
No Drawing. Continuation-in-part of application Ser. No. 548,402, May 9, 1966. This application Dec. 30, 1966, Ser. No. 606,053
Int. Cl. C07d *29/16*
U.S. Cl. 260—240 K **17 Claims**

Compounds of the formula



in which R and Z are as defined below, which possess analgesic and muscle relaxant activity and are useful as analgesics and skeletal muscle relaxants in animals, and processes for the preparation of the foregoing compounds.

3,646,015
OPTICAL BRIGHTENER COMPOUNDS AND DETERGENT AND BLEACH COMPOSITIONS CONTAINING SAME
Lewis R. Hamilton, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed July 31, 1969, Ser. No. 846,602
Int. Cl. C07d *27/48*
U.S. Cl. 260—240 CA **8 Claims**

Optical brightener compounds defined as isoindolinyl compounds. The optical activity of these compounds can

be employed to advantage in the optical brightening of a wide variety of natural and synthetic materials. They are useful in the brightening of fabrics and find application in the preparation of laundry detergent compositions and hypochlorite bleach-containing compositions.

3,646,016

NOVEL NITROIMIDAZOLE HYDRAZONE DERIVATIVES

David W. Henry, Menlo Park, Calif., and Dale R. Hoff, Cranford, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Application Feb. 4, 1965, Ser. No. 430,250, now Patent No. 3,472,864, dated Oct. 7, 1969, which is a continuation-in-part of application Ser. No. 352,966, Mar. 18, 1964. Divided and this application Oct. 25, 1968, Ser. No. 794,814

Int. Cl. C07d *49/36*

U.S. Cl. 260—240 G 7 Claims

Novel imidazole hydrazones are provided which are active against the protozoal diseases trichomoniasis, enterohepatitis, and amebiasis, as well as PPLO organisms and certain bacteria.

3,646,017

PROCESS FOR PRODUCING POLYMETHINE DYES

Walter F. Hoffstadt, Vestal, N.Y., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed May 7, 1969, Ser. No. 822,737

Int. Cl. C09b *23/00*

U.S. Cl. 260—240.1 9 Claims

An improved process for the producing of sensitizing dyes, e.g., carbocyanine, merocyanine, chain-substituted carbocyanines and methylene chain-substituted polycarbocyanine and merocyanine dyes, etc., wherein an active methylene-containing compound is reacted with an ammonium compound containing an N-vinyl or N-polyvinyl or N-methylene or N-phenyl-urethane group. Alternatively, such process is conducted by reacting the active methylene group containing compounds with an in situ or a preformed intermediate produced by the reaction of ethyl chloroformate and an anilinovinyl, polyvinyl or methylene quaternary ammonium compound.

3,646,018

OXIDATIVE COUPLING AND DEHYDROGENATION OF METHYL-SUBSTITUTED AROMATIC AND HETEROCYCLIC COMPOUNDS

Roy B. Duke, Jr., and Larry M. Echelberger, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed May 27, 1969, Ser. No. 828,351

Int. Cl. C07c *3/10*

U.S. Cl. 260—240 E 35 Claims

Substituted aromatic and heterocyclic compounds, where at least one of the substituents is a methyl group (e.g. toluene) are contacted in the vapor phase with oxygen or an oxygen-containing gas and iodine, to form a reaction mixture. This reaction mixture is passed through a reactor containing a substantially inert contact surface, such as granular rocks and then over a catalytic mass containing a chromite at gas hourly space velocities of about 5 to 1500 $hr.^{-1}$ and at temperatures of from about 300° to 1300° F. to form the corresponding saturated and unsaturated coupled products (e.g. bibenzyl and stilbene).

3,646,019

ANTICESTODE HYDRAZINOQUINOLINES

Philip Paul Actor, Phoenixville, Pa., and Cesare Enrico Giuseppe Pellerano, Siena, Italy, assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Sept. 19, 1969, Ser. No. 859,593

Claims priority, application Italy, Oct. 26, 1968, 23,025/68

Int. Cl. C07d *33/52*

U.S. Cl. 260—240 G 5 Claims

4 - (heterocyclic aryl methylenehydrazino) quinolines are prepared by reaction of a 4-hydrazinoquinoline with a heterocyclic carboxaldehyde. The products, which may be substituted at the 2,5,6,7, or 8-positions, are anticestodes. 4 - (pyridylmethylenehydrazino) - 2 - methylquinolines are preferred.

3,646,020

4-ACYLOXY-3-PHENYLCARBAMYL-2H-1,2-BENZOTHIAZINE 1,1-DIOXIDES

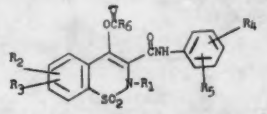
Harold Zinnes, Rockaway, Neil A. Lindo, Chatham, and John Shavel, Jr., Mendham, N.J., assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.

No Drawing. Filed July 16, 1970, Ser. No. 55,560

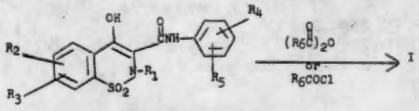
Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R 1 Claim

Substituted 4-acyloxy-3-phenylcarbamyl-2H-1,2-benzothiazine 1,1-dioxides, having the following structural formula:



wherein R_1 is alkyl, aralkyl, cyanomethyl, carboalkoxymethyl, and the like. R_2, R_3, R_4 and R_5 are hydrogen, alkyl, halogen, nitro, acylamino, amino, monoalkylamino, dialkylamino, alkoxy, carboalkoxy, cyano, trifluoromethyl, methylenedioxy, and the like, and R_6 is alkyl, aryl, heterocyclic or alicyclic. These compounds are prepared in accordance with the following reaction scheme:



The compounds of this invention are useful as anti-inflammatory and antipyretic agents.

3,646,021

4 - HYDROXY - 3 - FURYLCARBAMYL - 2H - 1,2-BENZOTHIAZINE 1,1-DIOXIDES AND PROCESS THEREOF

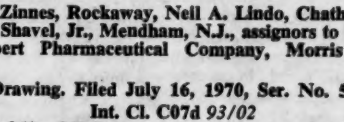
Harold Zinnes, Rockaway, Neil A. Lindo, Chatham, and John Shavel, Jr., Mendham, N.J., assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.

No Drawing. Filed July 16, 1970, Ser. No. 55,559

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R 3 Claims

A 3-substituted benzothiazine having the structural formula



is disclosed, wherein R_1 is alkyl, aralkyl, cyanomethyl, carboalkoxymethyl, and the like. R_2, R_3, R_4 and R_5 are hydrogen, alkyl, halogen, nitro, cyano, carboalkoxy, trifluoromethyl and the like. These compounds are prepared by treating the corresponding 2-R_1-2H-1,2-benzothiazine-4(3H)-one 1,1-dioxide with the appropriate R_4–R_5-substituted furylisocyanate in the presence of a strong base. The compounds of this invention are useful as anti-inflammatory, antipyretic and analgesic agents.

3,646,022

FIVE AND SIX MEMBERED HETERO S AND HETERO N FUSED RING COMPOUNDS

Wilfried Graf, Binningen, Basel-Land, and Erich Schmid, Basel, Switzerland, assignors to Ciba-Geigy Corporation

No Drawing. Continuation-in-part of application Ser. No. 429,906, Feb. 2, 1965. This application June 7, 1968, Ser. No. 735,179

Claims priority, application Switzerland, Feb. 5, 1964, 1,388/64; Feb. 11, 1964, 1,629/64

Int. Cl. C07d *91/04, 93/08*

U.S. Cl. 260—243 R **14 Claims**

Heterocyclic compounds having at least two rings, each having 5 to 6 ring members and fused through a common nitrogen and a carbon atom which are adjacent and having a sulfur atom in one ring in a position adjacent to the carbon atom common to both rings, a keto group in the other ring in a position adjacent to the nitrogen atom common to both rings and an aryl substituent on the carbon atom common to both rings are anti-inflammatory and CNS active agents.

3,646,023

DERIVATIVES OF 7-AMINOCEPHALOSPORANIC ACID

Hans Bickel, Binningen, Johannes Mueller and Rolf Bosshardt, Arlesheim, Heinrich Peter, Riehen, and Bruno Fechtig, Reinach, Basel-Land, Switzerland, assignors to Ciba-Geigy Corporation

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,638

Claims priority, application Switzerland, Dec. 11, 1968, 18,498/68; Apr. 23, 1969, 6,149/69; June 24, 1969, 9,637/69

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **6 Claims**

Derivatives of 7-(tetrazolyl-acetylamino)-cephalosporanic acid. Use: antibiotics.

3,646,024

7-[α-(3-IMIDOYLUREIDO)-ARYLACTAMIDO] CEPHALOSPORANIC ACIDS

Charles Truman Holdrege, Camillus, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Sept. 4, 1969, Ser. No. 855,375

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **29 Claims**

7 - [α - (3 - imidoylureido)arylacetamido]cephalosporanic acids and their salts and the corresponding betaines and desacetoxy derivatives are valuable as antibacterial agents, nutritional supplements in animal feeds, therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by gram-positive and gram-negative bacteria. 7 - [D - α - (3 - benzimidoylureido)phenylacetamido] cephalosporanic acid, a preferred embodiment of the invention, is prepared, for example, by Raney nickel hydrogenation (50 p.s.i., R.T.) of an aqueous solution of sodium 7-[D-α-(3-phenyl - 1,2,4 - oxadiazole - 5 - amino) phenylacetamido]cephalosporanate which is prepared in turn by reaction of sodium cephaloglycin with 5-chloro-3-phenyl-1,2,4-oxadiazole.

3,646,025

7-[α-(1,3-SUBSTITUTED AMIDINO-2-THIO)ACETAMIDO]CEPHALOSPORANIC ACIDS

Leonard Bruce Crast, Jr., Clay, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Oct. 30, 1969, Ser. No. 872,769

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **46 Claims**

Certain 7 - [α - (1,3 - substituted - amidino - 2 - thio) acetamido]-cephalosporanic acids and derivatives thereof were prepared and found to be potent antibacterial agents, e.g., the reaction of 7-(α-bromoacetamido)cephalosporanic acid with 1,3-diethylthiourea produced 7-[α-(1,3-diethylamidino-2-thio)acetamido]cephalosporanic acid.

3,646,026

PHENYL N-METHYL CARBAMATES

Erwin Nikles, Liestal, and Ladislaus Pinter, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Aug. 28, 1967, Ser. No. 663,509

Claims priority, application Switzerland, Sept. 2, 1966, 12,785/66

Int. Cl. C07d *87/36, 87/42*

U.S. Cl. 260—247.2 B **4 Claims**

The invention relates to carbamates of general formula

wherein R represents an alkylene or alkenylene residue containing 4 or 5 carbon atoms which may be interrupted by an oxygen atom and which may be substituted by lower alkyl groups, and X_1 and X_2 may be identical or different and represent a hydrogen atom, a halogen atom or a lower alkyl group with the proviso that simultaneously there must not be present two of the substituents in the ortho position to the carbamoyloxy residue, and their salts with inorganic and organic acids, and pesticidal preparations containing such carbamates, as active ingredients, together with a suitable carrier.

3,646,027

1-SUBSTITUTED-NITROIMIDAZOL-2-YL-ALKYL CARBAMATES

John A. Carlson, Delmar, N.Y., Dale R. Hoff, Basking Ridge, N.J., and Clarence S. Rooney, Beaconsfield, Quebec, Canada, assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 550,932, May 18, 1966, which is a continuation-in-part of application Ser. No. 470,239, July 7, 1965. This application Sept. 5, 1969, Ser. No. 855,765

Int. Cl. C07d *49/36, 87/36*

U.S. Cl. 260—247.2 B **14 Claims**

1-substituted-5-nitroimidazol-2-yl-alkyl carbamates and acid addition salts thereof are prepared from 1-substituted-5-nitroimidazoles having at the 2-position of the imidazole ring an hydroxyalkyl, mercaptoalkyl, alkylsulfonyloxyalkyl, alkarylsulfonyloxyalkyl, haloalkyl, halocarbonylalkyl or halothiocarbonyloxyalkyl radical. The 1-substituted-5-nitroimidazol-2-yl-alkyl carbamates are useful in the treatment of parasitic diseases. Antiparasitic compositions in which the active ingredient is a 1-substituted-imidazole-2-yl-alkyl carbamate are also provided.

3,646,028

CERTAIN 2-AMINO-4-PHENYL-3,4-DIHYDROQUINAZOLINES

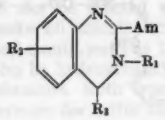
Gordon Northrup Walker, Morristown, N.J., assignor to Ciba Corporation, Summit, N.J.

No Drawing. Continuation-in-part of application Ser. No. 731,316, May 22, 1968, which is a continuation-in-part of application Ser. No. 638,657, May 15, 1967, which in turn is a continuation-in-part of application Ser. No. 579,483, Sept. 15, 1966, now Pat. No. 3,560,501. This application Sept. 22, 1969, Ser. No. 860,090

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.5 R 6 Claims

2-amino-4-aryl-3,4-dihydro-quinazolines of the formula



Am=an amino or hydrazino group

R_1=H, aliphatic or araliphatic radical

R_2=H, alkyl, alkoxy, (alkylmercapto, halogeno, CF_3 or NO_2

R_3=aromatic radical

acyl derivatives, quaternaries and salts thereof, such as the 2-dimethylamino-4-phenyl-6-chloro-3,4-dihydro-quinazoline hydrochloride, exhibit anti-inflammatory and coronary dilatory effects.

3,646,029

PIPERAZINO METHYL 1,3 DIARYLGUANDINES

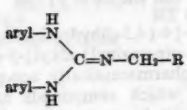
Darrell Dexter Mullins, Nitro, W. Va., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 25, 1968, Ser. No. 762,608

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R 6 Claims

Compounds of the formula



where R is hydroxy, halogen, amino, nitroalkyl, or N-arylcarbamoyloxy are described which are useful for control of soil borne pathogenic organisms which attack the underground parts of plants.

3,646,030

METHOD FOR THE PREPARATION OF BASIC DERIVATIVES OF 9-OXO-10-OXA-9:10-DIHYDROANTHRACENE

Davide Milani, Milan, Italy, assignor to Mondi Pharma Establishment, Vaduz, Liechtenstein

No Drawing. Filed Mar. 25, 1969, Ser. No. 810,373

Int. Cl. C07d *87/34*

U.S. Cl. 260—247.7 F 3 Claims

A few basic derivatives of 9-oxo-10-oxa-9:10-dihydroanthracene are disclosed, which have an intense stimulating effect on respiration. A method for the preparation of these compounds is also disclosed and mainly consists in the reaction of an N-halogen succinimide with 4-methyl-9-oxo-10-oxa-9:10-dihydroanthracene which has been substituted in the 3 position by a selected substituent.

3,646,031

2-MORPHOLINO CARBONYL PYRAZINES

Hiroshi Abe, Nishinomiya-shi, Yukio Shigeta, Kobe, Fumihiko Uchimaru, Koganei-shi, Seizaburo Okada, Inba-gun, and Akira Kosasayama, Tokyo, Japan, assignors to Daiichi Seiyaku Company, Limited, Tokyo, Japan

No Drawing. Filed Sept. 16, 1968, Ser. No. 762,348

Claims priority, application Japan, Sept. 20, 1967, 42/59,861, 42/59,862

Int. Cl. C07d *87/40*

U.S. Cl. 260—247.5 R 3 Claims

Novel 2-carbonyl pyrazine derivatives are prepared by reaction of the corresponding pyrazine-2-carboxylic acid derivatives with alkyl alcohol or by reaction of the corresponding ester with an amine, and are useful as oral hypoglycemic agent or as reducing agent of non-esterified fatty acid level.

3,646,032

AZIDO-S-TRIAZINES

William J. Priest and Akemi S. Marshall, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application July 25, 1967, Ser. No. 655,740, now Pat. No. 3,532,500. Divided and this application Jan. 16, 1970, Ser. No. 8,135

Int. Cl. C07d *55/18, 55/20*

U.S. Cl. 260—249.9 3 Claims

s-Triazines substituted on a nuclear carbon atom with at least one azido group and at least one substituent having a conjugated structure, the pi electron system of which is strongly coupled with that of the triazine nucleus, and which absorbs light in the 300 to 400 mμ range, such as an aromatic substituent, are useful as gas-forming or photoblowing agents in vesicular compositions. These triazines are produced from cyanuric chloride and cyanuric bromide by reaction with a compound which provides the desired non-azido substituent to produce a substituted mono- or dichloro-s-triazine or a mono- or dibromo-s-triazine, followed by reaction with sodium azide to replace chlorine or bromine by the azido group. The azido-s-triazines so prepared are advantageously used in vesicular compositions. The specification and claims designate the scope of the present invention.

3,646,033

DERIVATIVES OF ISOINDOLINE

Heinrich Leister, Cologne-Stammheim, and Heinrich Vollmann, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

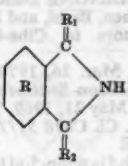
No Drawing. Filed Sept. 8, 1967, Ser. No. 666,458

Claims priority, application Germany, Sept. 9, 1966, F 50,163

Int. Cl. C07d *49/38, 27/48*

U.S. Cl. 260—250 R 6 Claims

Isoindoline derivatives asymmetrically disubstituted in the 1- and 3-position corresponding to the general formula

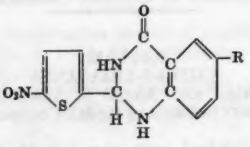


in which the cyclic radical R is an aromatic ring, a substituted aromatic ring, a tetrahydrogenated aromatic ring, a nitrogen-containing heterocyclic ring, or a sulphur-containing heterocyclic ring and R_1 and R_2, which are different, are bivalent radicals of a compound which con-

tains two active hydrogen atoms attached to a carbon or nitrogen atom and a two-stage process for making the same. The isoindoline derivatives are excellent dyestuffs for dyeing and printing synthetic fiber materials.

3,646,034
2,3-DIHYDRO-2-(5-NITRO-2-THIENYL) QUINAZOLIN-4(1H)ONES
Robert J. Alaimo, Norwich, N.Y., assignor to The Norwich Pharmacal Company
No Drawing. Filed May 18, 1970, Ser. No. 38,553
Int. Cl. C07d *51/48*
U.S. Cl. 260—251 QA 4 Claims

A series of 2,3-dihydro-2-(5-nitro-2-thienyl)quinazolin-4(1H)ones of the formula:



wherein R is hydrogen, chloro or nitro are especially inimical to *Hemophilus vaginalis.*

3,646,035
1-PHENYL-4-PYRROLINYLPIPERAZINES AND RELATED COMPOUNDS
Fred M. Hershenson, Evanston, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed Feb. 16, 1970, Ser. No. 11,842
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PH 7 Claims

1-phenylpiperazines having a pyrrolinyl, tetrahydropyridyl, or tetrahydroazepinyl substituent at the 4-position are described herein. They possess antibacterial, antiprotozoal, anthelmintic, anti-fungal, and anti-algal activity. The compounds are prepared by the reaction of a 1-phenylpiperazine with the appropriate imido ester.

3,646,036
1-FARNESYLACETYL-4-HYDROXYALKYL-PIPERAZINES
Ivar Laos, Skokie, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed Mar. 30, 1970, Ser. No. 24,010
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 C 6 Claims

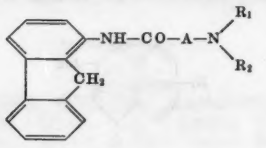
N-substituted farnesylacetyl piperazines are prepared by acylation of an N-substituted piperazine with a farnesylacetyl halide. These amides exhibit valuable pharmacological properties, e.g. anti-ulcerogenic, anti-bradykinin, anti-protozoal and anthelmintic.

3,646,037
IMIDAZOLIDINONE DERIVATIVES
Walter Schindler, Riehen, Basel, and Erich Schmid, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Filed Mar. 26, 1970, Ser. No. 24,392
Claims priority, application Switzerland, Mar. 28, 1969, 4,799/69; May 21, 1969, 7,693/69
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR 8 Claims

1 - [4-[3-[dibenz[b,f]azepin-5-yl]-2-methyl-propyl]-1-piperazinyl-alkyl] - 3-alkyl-2-imidazolidinone derivatives and the pharmaceutically acceptable acid addition salts thereof are useful for the treatment of psychosomatic disturbances; an illustrative embodiment is 1-[2-[4-[3-(5H-dibenz[b,f]azepin - 5 - yl)-2-methyl-propyl]-1-piperazinyl]-ethyl]-3-methyl-2-imidazolidinone.

3,646,038
1-(N-METHYLPIPERAZINEACETYL) AMINOFLUORENE
René Rachel De Ridder, Brussels, Belgium, assignor to Manufacture de Produits Pharmaceutiques A. Christiaens Societe Anonyme, Brussels, Belgium
No Drawing. Filed Oct. 13, 1967, Ser. No. 675,076
Claims priority, application Great Britain, Oct. 14, 1966, 46,129/66, 46,131/66
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TRI 1 Claim

Derivatives of 1-aminofluorene of the formula:



and the pharmaceutically acceptable addition salts thereof, in which A is —CH_2— or

R_1 and R_2 are identical or different and each represents a methyl, ethyl, propyl or butyl group, or R_1 and R_2 represent together with the attached nitrogen atom a nitrogeneous heterocyclic group having 1 or 2 nitrogen atoms as hetero-atoms and 4 or 5 carbon atoms in the ring, are effective as anticonvulsants.

3,646,039
4,5-DIHYDROTHIENO[2,3-b][1]BENZOTHIEPIN DERIVATIVES AS CNS DEPRESSANTS
Walter Schindler, Riehen, near Basel, and Armin Zust, Birsfelden, near Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed June 10, 1969, Ser. No. 832,011
Claims priority, application Switzerland, June 20, 1968, 9,211/68; Dec. 23, 1968, 19,149/68
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR 7 Claims

1 - [2 - or 1-[3-[4-(4,5-dihydrothieno[2,3-b][1]benzothiepin - 4 - yl)-1-piperazinyl]-alkyl]-3-alkyl-2-imidazolidinones and the pharmaceutically acceptable acid addition salts thereof which compounds exhibit depressant activity on the central nervous system; pharmaceutical compositions comprising these compounds and their salts as aforesaid and methods of producing central nervous system depressant effects in mammals which comprise administering an effective amount of a compound according to the invention or a pharmaceutically acceptable acid addition salt thereof; an illustrative embodiment is 1-[2-[4 - (4,5 - dihydrothieno[2,3-b][1]benzothiepin-4-yl)-1-piperazinyl]-ethyl]-3-methyl-2-imidazolinone.

3,646,040
PROCESS FOR THE PREPARATION OF DIALKYLPYRIDINES
Dieter Dieterich and Rudolf Braden, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Jan. 16, 1969, Ser. No. 792,242
Claims priority, application Germany, Jan. 31, 1968, P 16 70 982.3
Int. Cl. C07d *31/10*
U.S. Cl. 260—290 P 6 Claims

Dialkylpyridines are prepared by reacting an oxetane and from 0.5 to 10 mols of ammonia, methylamine, dimethylamine and mixtures of the foregoing at a temperature of from about 180° C. to about 600° C.

3,646,041

SYM-TRIS-(4-PIPERIDYL) CYCLOHEXANES

Heinz Uelzmann, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company

No Drawing. Application Oct. 12, 1967, Ser. No. 674,760, now Patent No. 3,528,988, which is a continuation-in-part of applications Ser. No. 507,556, Nov. 12, 1965, and Ser. No. 571,687, Aug. 11, 1966. Divided and this application Jan. 8, 1970, Ser. No. 7,310

Int. Cl. C07d *29/26*

U.S. Cl. 260—293.63 1 Claim

4-vinyl pyridines are trimerized in the presence of an alkali metal organic imide in a solvent, for example the reaction product of sodium and ethylenimine in the presence of excess ethylenimine, to form 1,3,5-tris(4-pyridyl) cyclohexanes which can be reacted with alkyl benzene sulfonic acids to make oil soluble wetting agents useful in making water-in-oil emulsions. The 1,3,5-tris(4-pyridyl) cyclohexanes can also be hydrogenated to form 1,3,5-tris-(4-piperidyl) cyclohexanes. Both types of cyclohexanes find utility as accelerators for sulfur curable millable rubbers and resins, for example, natural rubber. The 1,3,5-tris(4-piperidyl) cyclohexanes can be used to cure epoxides, or anhydride containing polymeric materials (for instance, the copolymer of maleic anhydride and styrene); they will also crosslink or chain extend isocyanate terminated polyurethane prepolymers, or polyisocyanates, and can be used in the one-shot processes of making polyurethanes by mixing with the polyol, H_2O, etc. The 1,3,5-tris-(4-piperidyl) cyclohexanes can be reacted with epoxides and/or episulfides to make ethers and/or thioethers and polyether and/or thioether polyols and/or polythiols which can be reacted with isocyanates or polyisocyanates to make polyurethanes and polythiourethanes.

3,646,042

CERTAIN N-PHENYL, N-LOWER-ALKYL-PYRIDINE CARBOXAMIDES AND DERIVATIVES THEREOF

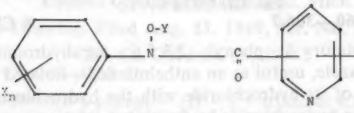
John Krenzer, Oak Park, and Sidney B. Richter, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 694,124, Dec. 28, 1967. This application Feb. 9, 1970, Ser. No. 10,057

Int. Cl. C07d *31/36*

U.S. Cl. 260—294.9 7 Claims

A compound of the formula



wherein n is an integer from 1 to 3; X is selected from the group consisting of halogen, lower alkyl, nitro, hydroxy, lower alkoxy, lower alkanoyl, and cyano; Y is selected from the group consisting of lower alkyl, lower alkanoyl, lower alkoxycarbonyl, lower alkythiocarbonyl and carbamoyl, Z is selected from the group consisting of halogen, lower alkyl, lower alkoxy, cyano and nitro; and p is an integer from 0 to 2.

3,646,043

CERTAIN O,O-DIALKYL-S-[(1-PYRIDYL-2)-ALKYL-THIOETHYL]-PHOSPHOROTHIOATES AND THE CORRESPONDING PHOSPHORODITHIOATES

Tatsumi Nishimura, Shimizu, Hiroshi Shinohara, Ogasagun, Kiyoshi Takita, Shimizu, and Masaru Kado, Yokohama, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed July 2, 1969, Ser. No. 838,701

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 K 7 Claims

Novel O,O-dialkyl-S-[1-(pyridyl)-alkylthioethyl]-phosphorothioates and -phosphorodithioates and insecticidal and miticidal compositions comprising the same as an active ingredient.

3,646,044

PRECIPITATION COPOLYMERIZATION OF MALEIC ANHYDRIDE IN AQUEOUS MEDIUM

Kazys Sekmakas, Chicago, Ill., assignor to De Soto, Inc., Des Plaines, Ill.

No Drawing. Filed May 21, 1969, Ser. No. 826,711

Int. Cl. C08f *33/00, 33/08*

U.S. Cl. 260—296 H 19 Claims

Maleic compound, such as maleic anhydride, and vinyl monomer, such as styrene, are copolymerized in aqueous medium containing water-miscible organic solvent so that polymerization takes place in an aqueous medium to cause the copolymer to precipitate as it is formed. When maleic anhydride is used, it hydrolyzes in the aqueous medium so that the copolymer which is formed is an acid copolymer.

3,646,045

INTERMEDIATES FOR 5-(4-PYRIDYLETHYL)-PYRIDOINDOLE DERIVATIVES

Leo Berger, Montclair, and Alfred John Corraz, Wayne, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Sept. 10, 1968, Ser. No. 758,711, now Patent No. 3,502,688, dated Mar. 24, 1970. Divided and this application Dec. 8, 1969, Ser. No. 883,290

The portion of the term of the patent subsequent to Dec. 16, 1986, has been disclaimed

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 R 22 Claims

5 - (4-pyridylethyl)-pyridoindole derivatives having analgesic activity, prepared from the correspondingly substituted 4-piperidones and N-amino-N-arylaminoethylpyridines, are described. The N-amino-N-arylaminoethylpyridines are prepared from the sequential intermediates N-arylaminoethylpyridines and N-nitroso-N-arylaminoethylpyridines.

3,646,046

1,6-DIMETHYL-10α-ERGOLINE DERIVATIVES

Federico Arcamone, Giovanni Franceschi, Alfredo Glasser, and Luciano Dorigotti, Milan, Italy, assignors to Societá Farmaceutici Italia, Milan, Italy

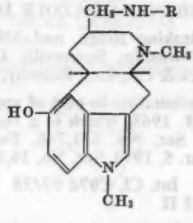
No Drawing. Filed Mar. 4, 1969, Ser. No. 804,287

Claims priority, application Italy, Mar. 7, 1968, 13,625/68

Int. Cl. C07d *43/20*

U.S. Cl. 260—285.5 7 Claims

Described are compounds of the formula:



wherein R is selected from the group consisting of the radical of an aliphatic, cycloaliphatic, aromatic and heterocyclic organic acid having from 1 to 10 carbon atoms

which may be substituted by halogen, hydroxy, nitro, amino or alkylamino groups, alkyl, aryl, alkoxy, aryloxy, thio-ether or sulphonic groups, of the radical of an alkyl, arylcarbonic and dialkylcarbamic acid, and a process for the preparation thereof. The compounds possess an antienteraminic, oxytocic, adrenolytic, hypotensive and sedative activity.

3,646,047

CERTAIN BENZO[b]THIOPHENE-2-CARBOXAMIDE DERIVATIVES

William Blythe Wright, Jr., Woodcliff Lake, N.J., and Herbert Joseph Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,090

Int. Cl. C07d *31/44*

U.S. Cl. 260—294.8 C **4 Claims**

The preparation of N-(tertiary-aminoalkyl)derivatives of benzo[b]thiophene - 2 - carboxamide and benzofuran-2-carboxamide by reacting the corresponding benzo[b] thiophene or benzo furan carboxylic acid with N,N'-carbonyldiimidazole and sequentially with a primary or secondary alkylamine, is described. Other methods of preparing the compounds of this invention are also described.

The present compounds possess central nervous system (CNS) activity and are useful as tranquilizers, CNS depressants, hypnotics and muscle relaxants.

3,646,048

N-(TERT-AMINOALKYL)-2-INDENE-CARBOXAMIDES

William Blythe Wright, Jr., Woodcliff Lake, N.J., and Herbert Joseph Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,091

Int. Cl. C07d *31/44*

U.S. Cl. 260—295 K **3 Claims**

The preparation of N-(tert. aminoalkyl) derivatives of substituted or unsubstituted 2-indenecarboxamides, is described. The compounds are prepared by several methods, the preferred method being the reaction of a substituted or unsubstituted indenecarboxylic acid with N,N'-carbonyldiimidazole and subsequently with a substituted alkylenediamine. These compounds are useful primarily for their depressant and analgesic activity.

3,646,049

ACYLAMINOBENZIMIDAZOLE DERIVATIVES

Dale R. Hoff, Basking Ridge, and Michael H. Fisher, Bridgewater Township, Somerville County, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 696,496, Jan. 9, 1968, which is a continuation-in-part of application Ser. No. 631,746, Feb. 3, 1967. This application Mar. 5, 1970, Ser. No. 16,957

Int. Cl. C07d *49/38*

U.S. Cl. 260—302 H **18 Claims**

Benzimidazoles having a heteroaryl substituent in the 2-position and a substituted amino radical at the 5- or the 6-position are prepared by variety of techniques including reaction of the corresponding 5-amino or 6-amino benzimidazole with the appropriate acyl halide or haloformate. These benzimidazoles are new compounds having significant anthelmintic activity. Benzimidazoles having the above-stated substituents at the 2- and 5- or 6-positions and further substituted at the 1-position with alkyl, aralkyl, hydroxy, acyl, carboxyalkoxy, carbamoyl, alkoxycarbonyl, alkenyloxy, or alkoxy, including substituted alkoxy, radicals are provided. The preferable substituent in the 1-position is an alkoxy which can be substituted by a large number of radicals.

3,646,050

2-AMINOBENZOTHIAZOLES CONTAINING A POLYFLUOROALKANOYL OF ALKOXY-POLYFLUOROALKYL SUBSTITUENT

Audley L. Cain, Amherst, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application May 18, 1966, Ser. No. 550,959, now Patent No. 3,480,612, dated Nov. 25, 1969. Divided and this application July 28, 1969, Ser. No. 857,259

Int. Cl. C07d *91/46*

U.S. Cl. 260—305 **2 Claims**

Production of certain novel 2-amino-benzothiazole compounds which serve as intermediates in the production of mono- and polyazo dyestuffs containing a polyfluoro alkanol or alkyl ether group and their corresponding quaternary ammonium salts which are particularly useful as dyes for acrylic fibers.

3,646,051

PROCESS FOR THE RESOLUTION OF A SUBSTITUTED IMIDAZOTHIAZOLE

François Dewilde, Saint-Marc-Massy, and Guy Gabriel Frot, Noisy-la-Sec, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,513

Claims priority, application France, Apr. 24, 1969, 6913030

Int. Cl. C07d *99/06*

U.S. Cl. 260—306.7 **6 Claims**

Laevorotatory 6 - phenyl - 2,3,5,6 - tetrahydroimidazo [2,1-b]thiazole, useful as an anthelmintic, is isolated from a mixture of its hydrochloride with the hydrochloride of the racemic hydrochloride by fractional solution in water.

3,646,052

7-v-TRIAZOLYL-(2)-COUMARIN COMPOUNDS

Otto Neuner and Alfons Dorlars, Leverkusen, Carl-Wolfgang Schellhammer, Opladen, and Otto Berendes, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 662,065, Mar. 10, 1967. This application Mar. 11, 1970, Ser. No. 18,003

Claims priority, application Germany, Mar. 19, 1966, F 48,712

Int. Cl. C07d *99/04;* **C09k** *1/02*

U.S. Cl. 260—308 A **9 Claims**

7-v-triazolyl - (2) - coumarin compounds as brightening agents for polyester and polyvinyl chloride materials.

3,646,053

CERTAIN-(2-AMINO-4-THIAZOLYL)INDOLES

John Frank Poletto, Nanuet, N.Y., and George Rodger Allen, Jr., Old Tappan, and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 632,556, Apr. 21, 1967. This application May 18, 1970, Ser. No. 38,551

Int. Cl. C07d *99/06*

U.S. Cl. 260—306.8 R 5 Claims

This disclosure describes compounds of the class of 3-(2-amino-4-thiazolyl)indoles useful as analgesic agents.

3,646,054

COUMARIN-v-TRIAZOLE OXIDES

Rudolf Kirchmayr, Binningen, Basel-Land, Hansjorg Heller, Riehen, and Jean Rody, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 704,587, Feb. 12, 1968. This application Aug. 28, 1970, Ser. No. 68,025

Int. Cl. C09k *1/02*

U.S. Cl. 260—308 A 8 Claims

2 - [3 - phenyl-coumarinyl-(7)]-v-triazole-1- (or -3-) oxides which are unsubstituted in 4- and 5-position at the triazole moiety, or have in one or both of the latter two positions non-chromogenic substituents, are described as fluorescers which are useful for the marking, invisible in daylight but fluorescent in ultraviolet light, of objects, such as pieces of laundry. Their production, especially by oxidizing coumarin-(7)-hydrazone-oximes is described.

Furthermore, the conversion of 2-coumarin-substituted v-triazole-1- (or -3-) oxides, by reduction, e.g. with hydrogen in statu nascendi, to the corresponding triazoles is also disclosed.

3,646,055

2,4-DIHYDRO-6-PHENYL-1H-s-TRIAZOLO[4,3-a][1,4] BENZODIAZEPIN-1-ONES

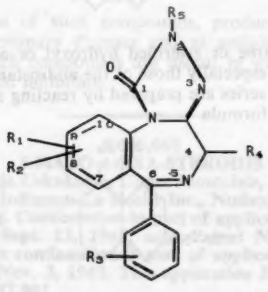
Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Aug. 21, 1969, Ser. No. 852,112

Int. Cl. C07d *53/06, 57/02*

U.S. Cl. 260—308 C 3 Claims

2,4-dihydro-6-phenyl - 1H - s - triazolo[4,3-a]benzodiazepin-1-ones of the formula:



wherein R_1, R_2, and R_3 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms ,inclusive, halogen, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoylamino and dialkylamino, in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive, and wherein R_5 and R_6 are selected from the group consisting of hydrogen and alkyl, defined as above, are produced from selected 1,3-dihydro-5-phenyl-2H-1,4-benzodiazepine-2-thiones (I) by condensation with alkyl carbazate, yielding the corresponding 3-(5-phenyl-3H-1,4-benzodiazepin-2-yl)carbazic acid alkyl ester (II), and then heating II to an elevated temperature to obtain compound III (in which R_5 is hydrogen). Alkylation of the latter yields the products of Formula III in which R_5 is lower alkyl .The compounds of Formula III as well as the intermediates II and the pharmacologically acceptable acid addition salts thereof are useful to sedate and tranquilize domestic and zoo animals, particularly mammals and birds.

3,646,056

PROCESS FOR THE PRODUCTION OF 5,5-DIPHENYLHYDANTOIN

Winfried Kolbeck, Munich, and Friedrich Bayerlein, Munich-Obermenzing, Germany, assignors to Diamalt Aktiengesellschaft, Munich, Germany

No Drawing. Filed Feb. 10, 1970, Ser. No. 10,317

Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 9 Claims

5,5-diphenylhydantoin is produced in one step by reacting benzoin with 1–3 equivalents of urea in an alkaline medium in the presence of 0.5–4 equivalents of elemental sulfur at a temperature between 60° C. and the boiling point of the reaction mixture.

3,646,057

2-NITROIMIDAZOLES

Alden Gamaliel Beaman, North Caldwell, N.J., and William Paul Tautz, New York, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Apr. 16, 1969, Ser. No. 816,838

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 12 Claims

2-nitroimidazoles substituted in the 1-position with a lower alkyl amide or a lower alkyl amine which are useful as germicides and anti-protozoal agents.

3,646,058

3-AMINO-4,4-DIHALO-5-PYRAZOLONES

Daniel Bertin, Montrouge, and Pierre Girault, Paris, France, assignors to Roussel-UCLAF, Paris, France

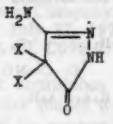
No Drawing. Filed Oct. 28, 1969, Ser. No. 871,959

Claims priority, application France, Nov. 7, 1968, 172,931

Int. Cl. C07d *49/16*

U.S. Cl. 260—310 A 2 Claims

3-amino-4,4-disubstituted-5-pyrazolones of the formula



(I)

wherein X is chlorine or bromine, and their acid, addition salts, which possess antibacterial activity, process for their preparation, antibacterial compositions containing them, and their use.

3,646,059

PLANT GROWTH REGULATORY UREIDOPYRAZOLES

Richard K. Brantley, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 5, 1969, Ser. No. 822,001
Int. Cl. C07d 49/20
U.S. Cl. 260—310 R 3 Claims

Certain ureidopyrazoles, such as (i) 5-(3-phenylureido)-1,3-dimethylpyrazole or (ii) 5-[3-(2-fluorophenyl) ureido]-4-chloro-1,3-dimethylpyrazole, have been found to be effective as plant growth modifiers. The ureidopyrazoles are particularly useful as defoliants on cotton, soybean, and dry bean plants.

3,646,060

DERIVATIVES OF 4a,9b - DIHYDRO - 8,9b-DIMETHYLDIBENZOFURAN AND OF 4a,9b-DIHYDRO - 8,9b-DIMETHYLDIBENZOFURAN-3(4H)-ONE

Elizabeth Benz Morlock, Bronx, and Jay Donald Albright and Leon Goldman, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 4, 1970, Ser. No. 34,519
Int. Cl. C07d 5/44
U.S. Cl. 260—326.3 4 Claims

This disclosure describes derivatives of 4a,9b-dihydro-8,9b-dimethyldibenzofuran and of 4a,9b-dihydro-8,9b-dimethyldibenzofuran-3(4H)-one useful as intermediates or as analgesic agents.

3,646,061

METHOD OF PREPARING N-ALKOXALYL AND N-FORMYL DERIVATIVES OF α-AMINO ACID ESTERS

Itsutoshi Maeda, Kanagawa-ken, Hideshi Miyayashiki, Tokyo, and Ryonosuke Yoshida, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed May 29, 1969, Ser. No. 829,139
Claims priority, application Japan, June 10, 1968, 43/39,796; Aug. 10, 1968, 43/56,916
Int. Cl. C07d 27/60; C07c 101/00
U.S. Cl. 260—326.14 T 6 Claims

Alkyl esters of alkoxalylamino or N-formylamino acids are produced in high yields directly by heating the acids with oxalic acid or formic acid and a lower alkyl alcohol at 80–200° C.

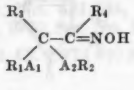
3,646,062

S,S-SUBSTITUTED 2,2-DI-THIO-, SULFINYL-, AND SULFONYL-ALKANAL AND ALKANONE N-SUBSTITUTED CARBAMOYLOXIMES

Tomas L. Fridinger and Edward L. Mutsch, Woodbury Township, Washington County, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 753,752, Aug. 19, 1969. This application July 11, 1969, Ser. No. 841,142
Int. Cl. C07c 131/00; C07d 71/00, 73/00
U.S. Cl. 260—327 M 7 Claims

New oximes having the formula



are reacted with selected isocyanates, or with phosgene followed by a reaction with a compound containing a reactive amino

function, to obtain S,S-substituted thio-, sulfinyl-, sulfonyl-alkanal and -alkanone N-substituted carbamoyloxime compounds having a high degree of effectiveness as nematocides, acaricides and insecticides when an effective amount of the compound is applied to plants or to the soil in which they are growing.

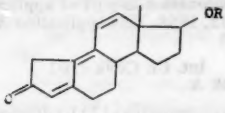
3,646,063

PROCESS FOR A-NOR $\Delta^{3(5),9,11}$-ESTRATRIENE-17β-OR-2-ONES

Robert Bucourt and Lucien Nedelec, Clichy-sous-Bois, and Jean-Claude Gasc, Bondy, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed May 29, 1968, Ser. No. 732,881
Claims priority, application France, May 29, 1967, 108,253; Aug. 23, 1967, 118,793
Int. Cl. C07d 13/04
U.S. Cl. 260—340.9 7 Claims

A process for the preparation of A-nor steroids of the formula



(I)

wherein R is selected from the group consisting of hydrogen, an acyl radical of an organic carboxylic acid of 1 to 18 carbon atoms and certain alkyl compounds and to novel intermediates produced therein and novel products produced thereby which have anabolic and androgenic activity.

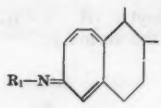
3,646,064

4-IMINO - 19 - NOR-A-HOMO-STEROID-TRIENES AND A PROCESS FOR THEIR MANUFACTURE

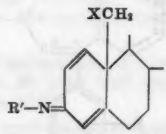
Georg Anner, Basel, and Peter Wieland, Oberwil, Basselland, Switzerland, assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,875
Claims priority, application Switzerland, Dec. 6, 1967, 17,109/67
Int. Cl. C07d 13/04
U.S. Cl. 260—340.9 11 Claims

Steroid compounds of the partial formula



wherein R_1=free or esterified hydroxyl or a substituted amino group, especially those of the androstane, pregnane or cholestane series are prepared by reacting a compound of the partial formula



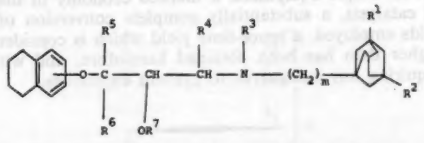
wherein X is a hydroxyl group esterified with a strong inorganic or organic acid, with a strong inorganic or organic base. Use: Intermediates for the manufacture of the known, pharmacologically active 4-oxo-19-nor-A-homosteroid-2,4a,10(1)-trienes.

3,646,065
16-OXA STEROIDS
Richard Wightman Kierstead, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Original application Nov. 15, 1965, Ser. No. 496,649, now Patent No. 3,448,123, dated June 23, 1969. Divided and this application Feb. 17, 1969, Ser. No. 799,924
Int. Cl. C07d 5/04
U.S. Cl. 260—340.9 1 Claim

This invention relates to 17-hydroxy-16-oxa-androstan-3-ones, intermediates therefor and processes for making the same. These compounds can be prepared from the corresponding D-ring lactones wherein the 3-carbonyl substituent is protected, i.e., 16-oxa-androstan-17-ones. The subject compounds are pharmaceutically useful as anti-androgens.

3,646,066
ADAMANTYLAMINO-TETRAHYDRONAPHTHYL-OXYPROPANOLS AND ESTER DERIVATIVES
Venkatachala Lakshmi Narayanan, North Brunswick, and Jack Bernstein, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.
No Drawing. Filed Mar. 25, 1970, Ser. No. 22,663
Int. Cl. C07c 93/00, 93/26
U.S. Cl. 260—343.7 13 Claims

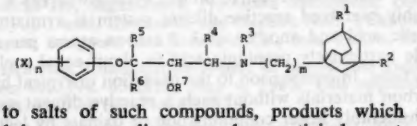
This invention relates to new adamantylamino-5,6,7,8-tetrahydronaphthyloxypropanols and related compounds of the formula



and to salts of such compounds, products which are useful in coronary diseases and as antiviral agents.

3,646,067
ADAMANTYLAMINOPHENOXYPROPANOLS AND ESTER DERIVATIVES
Venkatachala L. Narayanan, North Brunswick, and Jack Bernstein, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.
No Drawing. Filed July 23, 1970, Ser. No. 57,791
Int. Cl. C07c 93/00, 93/26
U.S. Cl. 260—343.7 13 Claims

This invention relates to new adamantylaminophenoxypropanols and related compounds of the formula:



and to salts of such compounds, products which are useful in coronary diseases and as antiviral agents. In addition, such compounds are useful in water softening and corrosion inhibition.

3,646,068
6-HALO-4-OXA-STEROIDS
Milan Radoje Uskokovic, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Continuation-in-part of application Ser. No. 759,794, Sept. 13, 1968, now Patent No. 3,576,849, which is a continuation-in-part of application Ser. No. 680,308, Nov. 3, 1967. This application June 19, 1970, Ser. No. 47,901
Int. Cl. C07d 10/00
U.S. Cl. 260—343.2 S 15 Claims

6-halo-4-oxa-3-oxo-androstanes are prepared via halogenation of 3,5-seco-A-nor-3-oic acids followed by reduction and then lactonization. The end-products are useful as antiandrogens. Particularly preferred embodiments, i.e., 6α-bromo-17β-hydroxy-17α-methyl - 4 - oxa-androstan-3-one are useful as topical agents against acne.

3,646,069
PROCESS FOR MANUFACTURING A NAPHTHALIC ACID DERIVATIVE
Hitoshi Okada, Tokyo, Masaharu Kaneko, Kanagawa-ken, Yoshiaki Kato, Tokyo, and Hiroshi Honda, Kanagawa-ken, Japan, assignors to Sandoz Ltd., Basel, Switzerland
No Drawing. Filed June 16, 1969, Ser. No. 833,799
Claims priority, application Japan, June 18, 1968, 43/42,124; Oct. 7, 1968, 43/72,961
Int. Cl. C07c 63/02; C07d 7/18
U.S. Cl. 260—345.2 4 Claims

Naphthalic acid derivatives and their anhydrides are prepared from the corresponding acenaphthene derivatives by oxidation with chromic-sulfuric acid in benzene or substituted benzenes followed by oxidation with alkali metal hypochlorite in an aqueous, alkaline medium, and recovery of the desired products which are dyestuff intermediates.

3,646,070
5-ARYLOXATRICYCLO[3.2.2.0^{2,4}]NONANE-1-AMINES
Paul E. Aldrich, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Division of application Ser. No. 753,727, Aug. 19, 1968, now Patent No. 3,565,898, which is a division of application Ser. No. 641,412, May 8, 1967, now Patent No. 3,428,643. Divided and this application Aug. 19, 1970, Ser. No. 65,289
Int. Cl. C07d 1/00
U.S. Cl. 260—348 C 1 Claim

5-phenyl, 5 - substituted phenyl, 5 - pyridyl, and 5-substituted pyridyl oxatricyclo[3.2.2.0^{2,4}]nonan-1-amines, and N - carboalkoxy - 5 - phenyl, 5 - substituted phenyl, 5 - pyridyl, and 5 - substituted pyridyl oxatricyclo-[3.2.2.0^{2,4}]nonan-1-amines.

3,646,071
ANTHRAQUINONE COMPOUNDS
Wolfgang Frey, Munchenstein, Basel-Land, and Wolfgang Schoenauer, Riehen, Basel-Land, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland
No Drawing. Filed Mar. 18, 1969, Ser. No. 808,322
Claims priority, application Switzerland, Apr. 8, 1968, 5,122/68; May 31, 1968, 8,169/68; Sept. 30, 1968, 14,593/68
Int. Cl. C09b 1/30
U.S. Cl. 260—371 2 Claims

Water-soluble anathraquinone dyes which bear one or two 3,5,5-trimethylcyclohexylamino groups in the 1- and/or 4-positions and one of two —SO_3H groups bound either directly to a carbon atom of an aromatic ring or indirectly over an oxygen atom to a carbon atom of an aliphatic chain.

3,646,072
TURQUOISE BISCATIONIC ANTHRAQUINONE DYES
Daniel Shaw James, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed July 27, 1970, Ser. No. 58,708
Int. Cl. C09b 1/50
U.S. Cl. 260—380 2 Claims

Acid modified bulk continuous filament nylon fibers can be dyed in turquoise shades with biscationic anthraquinone dyes prepared by quaternizing the biscondensation product of an N,N-disubstituted C_{2-4} alkylenediamine and 1,4,5,8-tetrahydroxyanthraquinone. The biscationic dyes have excellent reserve on unmodified nylon fibers and fibers so dyed have sufficient light fastness for use in nylon styling carpeting.

3,646,073

PREPARATION OF 2,6-DI-TERT-HYDROCARBYL-BENZOQUINONES

John C. Wollensak, Bloomfield Hills, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,353
Int. Cl. C07c *49/64*
U.S. Cl. 260—396 R 4 Claims

Air oxidation of 2,4,6-tri-tert-hydrocarbylphenols forms a reaction mixture containing 2,6 - di-tert-hydrocarbyl benzoquinones. The mixture is acidified with a strong mineral acid such as phosphoric acid and then distilled to recover the benzoquinone in improved yield and purity.

3,646,074

3,17-DIOXYGENATED 16α,17α-METHANO-5α-ANDROSTANES AND UNSATURATED CONGENERS

William F. Johns, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 766,300, Oct. 9, 1968. This application Nov. 26, 1969, Ser. No. 880,394
Int. Cl. C07c *169/08, 169/20*
U.S. Cl. 260—397.4 19 Claims

Preparation of the captioned compounds — for example, 3β,17β-diacetoxy-16α,17α-methano-5α-androstane — and the androgenic and anabolic utility thereof is disclosed.

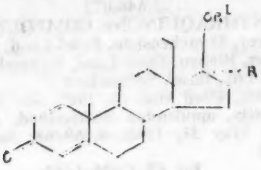
3,646,075

18-METHYL-1,4-ANDROSTADIENES AND PROCESS OF MAKING THE SAME

Hans-Detlef Berndt, Hermann Steinbeck, and Rudolf Wiechert, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

No Drawing. Filed July 24, 1969, Ser. No. 845,938
Claims priority, application Germany, July 27, 1968, P 17 93 055.1
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.4 5 Claims

18-methyl-1,4-androstadienes of the formula



wherein R is a saturated or unsaturated hydrocarbon residue and R^1 is hydrogen or acyl.

The compounds are made by dehydrogenating the corresponding 1,2-saturated steroids followed by acylating a free 17-hydroxyl group or saponifying a 17-acyloxy group.

The compounds have a high ratio of the anabolic main action to the androgenic side action. They are useful wherever a build-up of the body albumin is desired, particularly in general debility conditions and during convalescence.

3,646,076

PROCESS FOR ETHYNYLATING 17-KETO STEROIDAL PHENOLS

George C. Buzby, Jr., Philadelphia, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 2, 1970, Ser. No. 42,880
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 11 Claims

17α-ethynyl-13-(lower)alkylgona-(and 8-isogona)-1,3,-5(10)-trien-3,17β-diols and the Δ^7-, $\Delta^{8(9)}$- and $\Delta^{9(11)}$)-dehydro analogs thereof are produced from the corresponding 3-hydroxy-17-ketone compounds by reaction with alkali metal (lower)alkoxide followed by reaction with lithium acetylide-ethylenediamine complex and regeneration of the steroidal phenolic function with acid. The products of the process are hormonally active, especially estrogenically and anti-lipemically active and also are useful as intermediates in the preparation of other hormonally active steroids.

3,646,077

PROCESS FOR CONTINUOUSLY MANUFACTURING VINYL ESTERS

Gerhard Hübner and Helmut Kainzmaier, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany

No Drawing. Continuation-in-part of application Ser. No. 385,048, July 24, 1964. This application Oct. 23, 1967, Ser. No. 677,063
Claims priority, application Germany, Aug. 5, 1963, W 35,033; Mar. 9, 1964, W 36,351
Int. Cl. C07c *69/24, 69/76;* C11c *3/00*
U.S. Cl. 260—410.9 N 2 Claims

This invention relates to the continuous production of vinyl esters, and it has for its object to provide a novel and improved process for this purpose. Another object is to synthesize vinyl esters from acetylene and carboxylic acids having molecular weights in excess of 100, with the use of simple equipment, a marked economy in the use of catalysts, a substantially complete conversion of the acids employed, a space-time yield which is considerably higher than has been obtained heretofore, and without requiring any safeguards to prevent explosions.

3,646,078

OXIDATION OF HYDROCARBONS TO PRODUCE CARBOXYLIC ACIDS

Robert J. Fanning, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 442,577, Mar. 25, 1965, and Ser. No. 501,860, Oct. 22, 1965. This application Dec. 26, 1967, Ser. No. 718,642
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 15 Claims

This invention discloses that oxidation of hydrocarbon materials to produce carboxylic acids is enhanced in a single phase coordinated liquid system containing a suitable reactive diluent system. Propionic acid is a preferred single component reactive diluent system whereas a more highly preferred reactive diluent system is a mixture of acetic acid and another of 3–5 carbon atoms per molecule particularly propionic acid in about equal mol proportions. In comparison to the oxidation of typical hydrocarbon materials without such a reactive diluent system, considerably lower contamination of oxidate by lactones, heavy esters, hydroxyl groups and carbonyl groups is realized.

3,646,079

PREPARATION OF RHODIUM COMPLEXES

Malcolm J. Lawrenson, Twickenham, Middlesex, England, assignor to The British Petroleum Company Limited, London, England

No Drawing. Filed Feb. 7, 1969, Ser. No. 797,685
Claims priority, application Great Britain, Feb. 7, 1968, 6,112/68
Int. Cl. C07j *15/00*
U.S. Cl. 260—429 J 9 Claims

Rhodium complexes are made by reacting a rhodium carbonyl carboxylate with a reagent (other than a hydrogen halide) containing an active hydrogen atom. Acetyl acetonates and similar compounds are preferred.

3,646,080

COMPLEX EUROPIUM SALT

Harvey Pobiner, Princeton, N.J., assignor to American Can Company, New York, N.Y.

No Drawing. Original application June 14, 1967, Ser. No. 645,896. Divided and this application May 12, 1969, Ser. No. 835,859

Int. Cl. C07f 5/00
U.S. Cl. 260—429.2 1 Claim

A complex of a europium salt, soluble in acidic aqueous media, is provided in the form of europium trichloride complexed with a dipolar aprotic solvent of the type exemplified by N,N-dimethylformamide, N,N-dimethylacetamide, methyl sulfoxide, and N,N,N',N',N'',N''-hexamethylphosphoramide.

3,646,081

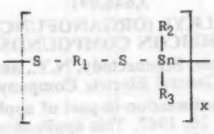
POLYMERIC TIN MERCAPTIDES

Bernard Buchholz, Blue Bell, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,094

Int. Cl. C07f 7/22; C08f 45/56
U.S. Cl. 260—429.7 5 Claims

Polymeric tin mercaptides of structure:



where R_1 is the hydrocarbon residue of a cycloaliphatic dimercaptan, R_2 and R_3 are alkyl groups of 4 to about 10 carbon atoms, and x is an integer from about 2 to about 10. The compounds of the invention are useful as non-toxic thermal stabilizers for polymers such as polyvinyl and polyvinylidene halides.

3,646,082

PROCESS FOR OPTICALLY RESOLVING DL-GLUTAMIC ACID AND SALTS THEREOF

Kenkichi Ito, Sagamihara, Naomasa Mizoguchi, Tokyo, Miyoji Dazai, Kawasaki, and Osahiro Sato, Yokohama, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 636,013, May 4, 1967. This application Sept. 4, 1970, Ser. No. 69,992

Claims priority, application Japan, May 21, 1966, 41/32,402

Int. Cl. C07f 3/06
U.S. Cl. 260—429.9 9 Claims

When a solution supersaturated with DL-glutamic acid (GA) and containing DL-glutamic acid hydrochloride (GA–HCl) is seeded with L-glutamic acid, and the seeded enantiomorph is thereby crystallized in a first crop of crystals, the solubility of D–GA–HCl in the solution is decreased and the solubility of L–GA–HCl is increased. If the solution is in a condition in which it is compatible with both GA and GA–HCl in the crystalline form, a second crop of D–GA–HCl crystals may therefore be produced simultaneously with the L–GA crystals, or L–GA–HCl may be preferentially dissolved by the solution from crystalline DL–GA–HCl, leaving the D–GA–HCl behind. The solution remains approximately balanced as to L- and D-forms and the undesired enantiomorphs do not tend to crystallize spontaneously. The crystals of the two different compounds are readily separated. D–GA and L–GA–HCl are obtained by seeding the original solution with D–GA. GA–HCl may be replaced in this mechanism by GA–HBr or the zinc and ammonium salts of GA which form conglomerates of the optically active forms when crystallized in the DL form, but those salts of DL–GA whose crystals are racemates are unsuited for the process.

3,646,083

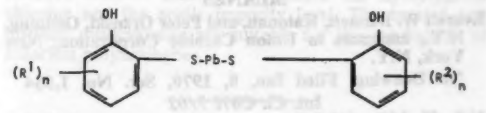
LEAD ORTHOMERCAPTOPHENOL SALT

Emil J. Geering, Grand Island, and George B. Stratton, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 666,914, Sept. 11, 1967. This application Dec. 31, 1969, Ser. No. 889,706

Int. Cl. C07f 7/24
U.S. Cl. 260—435 R 10 Claims

This invention relates to ortho-substituted phenol lead salts which have a stabilizing action on polyvinyl chloride, and which also impart a stable yellow coloration thereto, of which typical structural formulae are as follows:



in which R^1 and R^2 represent substituents and each n is independently an integer from 0 to 4.

3,646,084

METHOD OF MAKING IMIDATOSILANES

Milton L. Evans, Schenectady, Tyrone D. Mitchell, Troy, and Terry G. Selin, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Sept. 16, 1970, Ser. No. 72,853

Int. Cl. C07f 7/10, 7/18
U.S. Cl. 260—448.2 E 13 Claims

Imidatosilanes are prepared by reacting an imidate with a chlorosilane in an inert organic solvent and in the presence of an amine acid acceptor. The amine salt which is formed as a by-product of the reaction is removed from the imidatosilane which is formed by extracting it with water.

3,646,085

PERFLUOROALKYLETHERAMIDOALKYL-TRIALKOXYSILANES

Philip Lee Bartlett, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,303

Int. Cl. C07f 7/04, 7/18
U.S. Cl. 260—448.8 R 6 Claims

Perfluoroalkyletheramidoalkyltrialkoxysilanes having the formula $R_fO[C_3F_6O]_nCF(CF_3)CON(R)R'Si(OR'')_3$ wherein R_f is a perfluoroalkyl radical having from 1 to 6 carbon atoms, n is an integer from 0 to 8, R is hydrogen

or an alkyl group having from 1 to 6 carbon atoms and R' is an alkylene having from 1 to 12 carbon atoms or a

$$-CH_2-CH_2\overset{H}{N}-CH_2CH_2CH_2-$$

group, and R'' is an alkyl radical having from 1 to 6 carbon atoms. The novel compounds are useful as water repellents.

3,646,086

PREPARATION OF AMINE COMPLEXES OF ALUMINUM HYDRIDE

Leslie L. Sims, Mobile, Ala., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 729,913, May 17, 1968. This application Oct. 5, 1970, Ser. No. 78,155

Int. Cl. C07f 5/06

U.S. Cl. 260—448 R 6 Claims

A process for the synthesis of amine complexes of aluminum hydride by the reaction of a tertiary amine hydrohalide or a tertiary amine and an aluminum halide with sodium aluminum hydride in the presence of an ether solvent.

3,646,087

PREPARATION OF AMINOPHENYLTRIALKOXY SILANES

Everett W. Bennett, Katonah, and Peter Orenski, Ossining, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 8, 1970, Ser. No. 1,534

Int. Cl. C07f 7/02

U.S. Cl. 260—448.2 E 5 Claims

A process for preparing aminophenyltrialkoxy silanes by reacting a halophenyltrialkoxy silane with ammonia in the presence of a catalytic amount of copper and cuprous chloride.

3,646,088

PREPARATION OF SILOXANES BY REDISTRIBUTION

Georges Bakassian, Caluire, and Andre Bazquin, Luzinay, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Nov. 27, 1970, Ser. No. 93,505

Claims priority, application France, Nov. 27, 1969, 6940954

Int. Cl. C07f 7/08, 7/18

U.S. Cl. 260—448.2 P 8 Claims

A redistribution reaction between a siloxane and a chlorosilane, involving cleavage of a silicon oxygen bond, introduction of chlorine into one fragment of the siloxane and introduction of the residue of the chlorosilane into the other fragment of the siloxane, is carried out in a hexaalkylphosphotriamide.

3,646,089

PROCESS FOR PRODUCING ORGANOSILICON COMPOUNDS WITH ISOTHIOCYANATE SUBSTITUENT BONDED THROUGH DIVALENT BRIDGE

Abe Berger, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Filed Jan. 31, 1969, Ser. No. 796,647

Int. Cl. C07f 7/02

U.S. Cl. 260—448.2 E 8 Claims

A process for forming organosilicon compounds with an isothiocyanate group bonded to the silicon atom through an alkylene bridge or alkylene bridge having surfur, oxygen, or nitrogen linkages by reacting the corresponding aminoalkyl-substituted organosilicon compound with carbon disulfide and a dialkyl carbodiimide. A new class of organosilicon compounds having an isothiocyanate group bonded to the silicon atom through an alkylene bridge or alkylene bridge having sulfur, oxygen, or nitrogen linkages.

3,646,090

PROCESS FOR PREPARING LINEAR CHLORINE TERMINATED SILOXANE COMPOUNDS

Everett W. Bennett, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed May 29, 1969, Ser. No. 829,105

Int. Cl. C07f 7/08; C08f 11/04

U.S. Cl. 260—448.2 E 10 Claims

A process for preparing low molecular weight linear chlorine terminated siloxane polymers by reacting a cyclotri-, cyclotetra- or cyclopentasiloxane with thionyl chloride in the presence of a catalyst such as phosphine compound, a phosphine oxide or an amine N-oxide. The said siloxane polymers find utility as cross-linking agents for room temperature vulcanizable resins and rubber systems.

3,646,091

CYANOALKYL (ORGANOFUNCTIONAL) SILICON COMPOUNDS

Abe Berger, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 691,928, Dec. 20, 1967. This application July 18, 1969, Ser. No. 843,197

Int. Cl. C07f 7/10; C08g 31/00

U.S. Cl. 260—448.2 N 8 Claims

Organofunctional alkyl silicon materials are provided having, in addition, a cyanoalkyl substituent. These compounds are represented by the formula:

(1) QZSiYY'

where Q is a cyanoalkyl radical, Z is an organofunctional radical, an unsaturated aliphatic hydrocarbon radical, or a silalkylene group, Y is a halogen, and Y' is Y or a monovalent hydrocarbon radical free of aliphatic unsaturation. These organofunctional-alkyl silanes can be employed as intermediates for making organosilicon polymers.

3,646,092

PROCESS FOR THE RECOVERY OF TRIMETHYLFLUOROSILANE FROM A MIXTURE OF SILICONTETRACHLORIDE, TRIMETHYLCHLOROSILANE AND HYDROCARBONS BOILING AT THE SAME RANGE

Christian Dathe, Radebeul, Germany, assignor to Institut fur Silikon- und Fluorkarbon-Chemie, Radebeul, Germany

No Drawing. Filed May 20, 1969, Ser. No. 826,265

Int. Cl. C07f 7/04, 7/18

U.S. Cl. 260—448.2 E 6 Claims

A process for the recovery of trimethylfluorosilane from a mixture of silicontetrachloride, trimethylchlorosilane and hydrocarbons boiling in the same range, which comprises reacting said mixture with a difficultly soluble metal fluoride of the first to third main groups of the Periodic System of Elements at about normal temperature in the presence of a solvent including water and or-

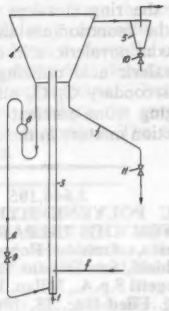
ganic solvents, and collecting the trimethylfluorosilane escaping from the reaction mixture by condensation. The trimethylfluorosilane can be used e.g. for making hexamethyldisiloxane which is an important material in the production of silicone oils.

3,646,093

PROCESS FOR THE CONTINUOUS HYDROLYSIS OF DIORGANODICHLOROSILANES

Robert Raphael Puthet, deceased, late of Lyon, France, by Daniel Gras, legal representative, 22 Avenue Montaigne, Paris France

Filed July 22, 1969, Ser. No. 845,124
Claims priority, application France, July 24, 1968, 160,463
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 E 3 Claims



Diorganopolysiloxanes of low viscosity and hydrogen chloride substantially free of organochlorosilanes are made simultaneously and continuously by passing diorganodichlorosilane and a small excess of water vapour to the base of a column containing upwardly circulating diorganopolysiloxane. Hydrogen chloride and part of the diorganopolysiloxane are withdrawn at the top of the column and the remainder of the diorganopolysiloxane is recycled to the base of the column.

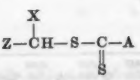
3,646,094

ALPHA CYANOBENZYL XANTHATES HAVING PESTICIDAL PROPERTIES

David Hugh Brooks, John Michael Cox, and Ian Trevor Kay, Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,707
Claims priority, application Great Britain, Mar. 7, 1968, 11,185/68
Int. Cl. C07c 154/02
U.S. Cl. 260—455 B 3 Claims

Compounds having pesticidal properties and characterized by the formula:



wherein Z represents a substituted or unsubstituted, aromatic group;

X represents an electron-withdrawing group; and A represents a group OR, SR or NR^1R^2 where R, R^1 and R^2 are hydrocarbon groups and where R^1 additionally can be hydrogen, or R^1 and R^2 together with the adjacent N atom form a heterocyclic ring.

3,646,095

ORGANIC DI-ISOCYANATES OF ALKYLADAMANTANES

Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 587,948, Oct. 20, 1966. This application Dec. 18, 1968, Ser. No. 784,952
Int. Cl. C07c 19/04
U.S. Cl. 260—453 AP 5 Claims

New compounds are disclosed which are 1,3 - diisocyanates of C_{12}–C_{20} alkyladamantanes having 1–2 alkyl groups attached to the adamantane nucleus. They are particularly useful as monomers for preparing polyurethane resins.

3,646,096

PURIFICATION OF AROMATIC DIISOCYANATES

Hans P. Horn, Orinda, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,841
Int. Cl. C07c 119/04
U.S. Cl. 260—453 SP 13 Claims

Aromatic diisocyanates are treated with zinc-fatty acid salts to remove hydrolyzable chlorine and acidic impurities. The desired results are obtained by utilizing diisocyanate-soluble zinc-fatty acid salts which can be separated from the treated diisocyanate by simple distillation and which are added to the diisocyanate in an effective amount sufficient to reduce the hydrolyzable chlorine and the acidic impurity level. The treated and distilled diisocyanates are suitable for the production of colorless polyurethanes.

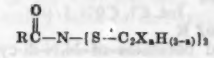
3,646,097

N,N-DI-(POLYHALOVINYLTHIO) CARBOXAMIDES

Lawrence E. Stevick, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Apr. 29, 1969, Ser. No. 820,316
Int. Cl. C07c 119/18
U.S. Cl. 260—453 R 5 Claims

N,N-di-(polyhalovinylthio) carboxamides of the formula:



wherein R is hydrogen or a hydrocarbyl radical of 1 to about 10 carbon atoms which has 0 to about 3 halogen substituents of atomic number 17 to 35, X is halogen of atomic number 17 to 35 and a is 2 or 3 the

indicating a polyhalovinylthio group. These carboxamides are fungicidal, algicidal and nematocidal.

3,646,098

BORON ACID ESTERS

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 458,786, May 25, 1965. This application Dec. 30, 1968, Ser. No. 787,990
Int. Cl. C07f 5/04
U.S. Cl. 260—462 R 5 Claims

Reaction product of polyhydroxydiphenyl alkane, ether, sulfide or amine, a borylating agent and an N,N-dihydrocarbyl-hydroxy amine, formed at a temperature of from about 60° to about 200° C. These compounds are useful as stabilizing agents for plastic, rubber, hydrocarbon distillate and other organic substrates normally subject to deterioration due to weathering, oxidation, heat, etc.

3,646,099

CYANO CONTAINING OLIGOMERS

Leland E. Dannals, Waterbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Oct. 12, 1967, Ser. No. 674,737
Int. Cl. C07c *121/00, 121/28, 121/41*
U.S. Cl. 260—465.4 8 Claims

The invention relates to a polymerization process employing a bisulfite salt as the initiator and the bisulfite terminated oligomers formed thereby. The oligomers and their salts are useful as conductive agents.

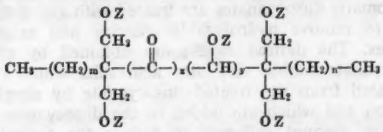
3,646,100

HIGH MOLECULAR WEIGHT POLYSULFATES

Samuel Sherman, Kensington, and Mitchell Danzik, Pinole, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Aug. 28, 1970, Ser. No. 68,030
Int. Cl. C07c *141/02*
U.S. Cl. 260—458 7 Claims

Detergent active materials which are effective in the absence of phosphate builders comprise high molecular weight polysulfates of the following structure:



in which m and n are integers from 0 to 40 and the sum of m and n is from 15 to 40, x and y are integers from 0 to 1 and the sum of x and y is 1, Z is H or $—SO_3Q$ in which Q is a water soluble, salt-forming cation, and at least 3 and preferably 4 Z's are $—SO_3Q$.

3,646,101

BORONATES AND BORINATES

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 702,835, Feb. 5, 1968, which is a continuation-in-part of application Ser. No. 367,854, May 15, 1964, now Patent No. 3,382,208. This application Mar. 9, 1970, Ser. No. 17,861
Int. Cl. C07f *5/04*
U.S. Cl. 260—462 R 4 Claims

Boronates and borinates of N,N-di-cycloalkylalkanolamine in which the alkanolamine moiety contains from 2 to 8 carbon atoms. These boronates and borinates are useful as weathering stabilizers in plastics, as additives in petroleum products and as bactericides.

3,646,102

METHOD FOR CONTINUOUSLY PREPARING POLYCARBONATE OLIGOMER

Akito Kobayashi, Kiyoshi Watanake, Yoshihiro Narita, Eiji Shiota, and Kenji Iwaoka, Yamaguchiken, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

No Drawing. Filed Aug. 11, 1969, Ser. No. 849,185
Claims priority, application Japan, Aug. 28, 1968, 43/61,132
Int. Cl. C08g *17/13, 17/005*
U.S. Cl. 260—463 11 Claims

Polycarbonate oligomer having a molecular weight of 450 to 500 is prepared with a good reproducibility and theoretical consumption of phosgene by introducing an aqueous caustic alkali solution of a dihydroxy compound and an organic solvent for polycarbonate oligomer into a tubular reactor, forming a mixed phase stream thereof and feeding thereto phosgene to effect reaction with the mixed phase stream thereof in a parallel-current flow, while temporarily removing the heat of reaction generated at the reaction in the form of the latent heat of vaporization of the said organic solvent.

3,646,103

PROCESS FOR THE PRODUCTION OF NITRILES

Juergen Luecke, Tubingen, Germany, assignor to Sandoz Ltd.

No Drawing. Continuation-in-part of application Ser. No. 807,914, Mar. 17, 1969. This application Jan. 15, 1970, Ser. No. 3,217
Int. Cl. C07c *121/00, 121/02, 121/12*
U.S. Cl. 260—465 13 Claims

Improvement in the production of nitriles by heating carboxylic acids or their functional derivatives with urea, which improvement consists in the additional use of amidosulphonic acid in the reaction mixture.

3,646,104

METHOD FOR THE RING CLEAVAGE OF 2,6-DIOXIMINOCYCLOHEXANONE

Tucker T. Yee, Claymont, Del., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed July 3, 1969, Ser. No. 839,060
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.4 4 Claims

Method for the ring cleavage of 2,6-dioximinocyclohexanone or the monosodium salt thereof to an ester of 5-cyano-2-oximinovaleric acid or an ester of 5-cyano-2-acetoximinovaleric acid utilizing acetic anhydride and a primary or secondary C_1–C_5 aliphatic alcohol at temperatures ranging from ambient to the reflux temperature of the reaction mixture in the absence of any catalyst.

3,646,105

POLYCYCLIC POLYENE HYDROCARBONS AND PROCESS FOR THE PREPARATION THEREOF

Sebastiano Cesca, Arnaldo Roggero, Aldo Priola, and Ermanno Cinelli, San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,289
Claims priority, application Italy, Dec. 18, 1968, 25,240/68
Int. Cl. C07c *13/28*
U.S. Cl. 260—666 PY 6 Claims

New termonomers are disclosed which are represented by the formula:

$$A—(CH_2)_n—$$

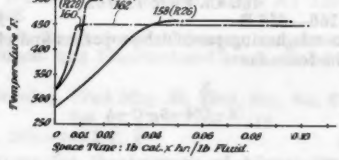
wherein A is a radical including at least one ring having an endomethylene group, B is a cyclodiene radical and n is 0–5.

3,646,106

CONTROL OF TRACE IMPURITIES IN PETROCHEMICAL PROCESSES

Norman L. Carr, Allison Park, and Rodney E. Peterson, Oakmont, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 12, 1970, Ser. No. 45,717
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 11 Claims



A petrochemical plant comprising reactor means including a catalyst capable of inducing a catalytic exothermic reaction therein, means for controlling the inlet and outlet temperatures of said reactor means, means for supplying

reactants including a normally liquid reactant to said reactor means, and control means for maintaining the temperature of said reactants above the dew point thereof in any part of said reactor means but below a temperature corresponding to a predetermined side reaction rate.

3,646,107

SUBSTITUTED 10,11-DIHYDRO-5H-DIBENZO[a,d] CYCLOHEPTENE ESTERS

Marcia E. Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Jan. 29, 1968, Ser. No. 723,964, now Patent No. 3,576,823. Divided and this application June 22, 1970, Ser. No. 48,477

Int. Cl. C07c *147/06, 125/06*

U.S. Cl. 260—470 **13 Claims**

A cis or trans 3α,12β-dihydro-8H-dibenzo[3,4:6,7]cyclohepta[1,2-d]-1,3-dioxol-8-one is treated with a Grignard reagent, i.e., a tertiary aminopropylmagnesium halide, and the Grignard adduct obtained hydrolyzed to form the corresponding 5-hydroxy-5-(3-tertiary aminopropyl) derivative which is dehydrated to form the corresponding 5-(3-tertiary aminopropylidene) derivative. The resulting compound is then hydrolyzed to form the cis or trans 10, 11 - dihydro-10,11-dihydroxy-5-(3-dimethylaminopropylidene)-5H-dibenzo[a,d]cycloheptene. Such compounds may be demethylated to produce the corresponding N-methylaminopropylidene compound. The compounds are useful as antidepressants.

3,646,108

FIBRE-FORMING POLYMERS

Edward Barry Jones and John Mather, Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 22, 1966, Ser. No. 596,061

Claims priority, application Great Britain, Sept. 23, 1965, 49,699/65

Int. Cl. C07c *65/20, 69/76, 143/52*

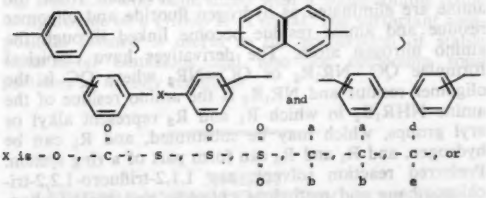
U.S. Cl. 260—473 G **9 Claims**

A compound of the formula:

$$R—OC—Ar—O(CH_2)_nO—Ar'—O(CH_2)_mO—Ar''—CO—R$$

where

Ar, Ar' and Ar'' are each of any one of the following diradicals:



X is —O—, —C(=O)—, —S—, —SO—, —SO₂—, —C(=O)O—, —C(=O)C(=O)—, —C(=O)C(=O)O—, or

a, *b*, *d* and *e* are each any one of the substituents —H, —CH_3 and —CH_2H_5,

R is hydroxy, halogen or alkoxy

m, *n* and *p* are each an integer which is not less than 2 and not more than 6, and the aromatic ring, or either or both of the aromatic rings, of the diradicals may optionally be substituted in at least one of the free positions, each such substituent being a methyl, ethyl, methoxy, ethoxy or halogen substituent, and polymeric products prepared therefrom. Shaped articles can be prepared from such polymeric products.

3,646,109

BENZYLAMINE SUBSTITUTED CARBAMATES

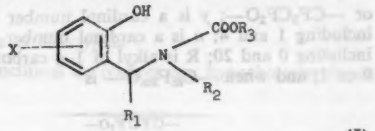
John Shavel, Jr., Mendham, and George Bobowski, Morristown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Original application May 18, 1966, Ser. No. 550,952, now Patent No. 3,452,048. Divided and this application Nov. 22, 1968, Ser. No. 778,338

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **4 Claims**

A class of substituted benzylamines of the formula:



(I)

wherein X is hydrogen, lower alkoxy; R_1 is heterocyclic; R_2 is lower alkyl or lower alkenyl; and R_3 is lower alkyl. These compounds are useful as anti-microbial agents.

3,646,110

BIS-(4-HYDROXY-3,5-DIALKYLBENZYL) CARBOXYLIC ACID ESTERS

Heinz Eggensperger, Gadernheim uber Bensheim, Volker Franzen, Heidelberg, Karl-Heinz Diehl, Bensheim, Bergstrasse, and Wilfred Kloss, Kolmbach uber Bensheim, Germany, assignors to Deutsche Advance Produktion G.m.b.H., Lautern am Odenwald, Germany

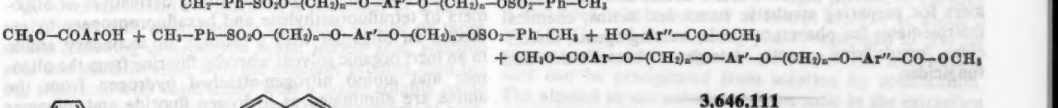
No Drawing. Filed Mar. 18, 1968, Ser. No. 714,100

Claims priority, application Germany, Mar. 17, 1967, D 52,555

Int. Cl. C07c *69/76, 121/76;* **C08f** *45/58*

U.S. Cl. 260—473 S **7 Claims**

Bis - (4 - hydroxy - 3,5 - dialkylbenzyl) carboxylic acid esters, particularly those of cyanoacetic and malonic acid, are stablilizers for resins. They are prepared by reacting 2 moles of the corresponding benzyl halides or Mannich bases with 1 mole of carboxylic acid ester.



3,646,111

PROCESS FOR THE MANUFACTURE OF PHENYL ESTERS AND PHENOL FROM BENZENE

Lothar Hörnig and Hans-Jürgen Arpe, Frankfurt am Main, and Manfred Boldt, Fischbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 8, 1968, Ser. No. 751,020

Claims priority, application Germany, Aug. 25, 1967, F 53,330

Int. Cl. C07c *37/00, 51/32*

U.S. Cl. 260—479 R **9 Claims**

The invention provides a process for the catalytic preparation of phenyl esters and, if desired, phenol, from benzene and saturated aliphatic carboxylic acids in the presence of a catalyst comprising a noble metal of Subgroup VIII of the Periodic Table and metals of main Group V or VI of the Periodic Table, the atomic number of which latter metals is at least 34.

3,646,112

PERFLUOROPOLYETHER ESTERS

John Deo Sterling, Jr., Wenonah, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,991
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R 6 Claims

Esters of the structural formula

$$[F(CF_2)_yO(C_mF_{2m}O)_nCF(X)COOCH_2]_{4-a}C(R)_a$$

wherein $-C_mF_{2m}O-$ has the structure

$$-CFCF_2O-$$
$$\quad\;|$$
$$\quad CF_3$$

or $-CF_2CF_2O-$; y is a cardinal number between and including 1 and 4; n is a cardinal number between and including 0 and 20; R is alkyl of 1–4 carbon atoms; a is 0 or 1; and when $-C_mF_{2m}O-$ is

$$-CFCF_2O-$$
$$\quad\;|$$
$$\quad CF_3$$

X is CF_3; and when $-C_mF_{2m}O-$ is $-CF_2CF_2O-$ X is F. The esters are prepared from the corresponding acyl fluoride and either a trimethylolalkane or pentaerythritol. The esters are useful as lubricants and hydraulic fluids.

3,646,113

BICYCLO[2.2.1]HEPT-5(6)-YL COMPOUNDS

Edward A. Rick, Charleston, W. Va., and Samuel W. Tinsley, Jr., Darien, Conn., assignors to Union Carbide Corporation

No Drawing. Original application Oct. 16, 1964, Ser. No. 404,474, now Patent No. 3,459,775. Divided and this application Oct. 24, 1967, Ser. No. 677,741
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 6 Claims

2-vinylbicyclo[2.2.1]hept - 5(6) - yl and 2-epoxyethylbicyclo[2.2.1]hept-5(6)-yl compounds, wherein the vinyl compounds are prepared by the addition of the active hydrogen-containing compounds to the strained-ring double bond of the bicyclo-heptene ring in 2-vinylbicyclo-[2.2.1]hept-5-ene and the epoxy compounds are prepared by the epoxidation of the vinyl compounds. The compounds find utility as solvents for resins and oils, monomers for preparing synthetic waxes and resins, chemical intermediates for pharmaceuticals, wetting agents, insecticides, emulsifying agents, detergents, bactericides and fungicides.

3,646,114

CYCLOPENTA <b> PHENANTHRENE STEROID ANALOGUE

Colin G. Pitt, Durham, N.C., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Dec. 23, 1970, Ser. No. 101,100
Int. Cl. C07c *69/14*
U.S. Cl. 260—488 B 3 Claims

This invention is addressed to novel cyclopentanophenanthrene steroid analogues including 8β-acetoxy, 4, 5,6,6aβ,7,7aβ,8,9,10,10aα,11,11aα - dodecahydro - 7a-methyl-1H-cyclopenta<b>phenanthrene-3(2H)-one, 8β-acetoxy, 6,6aβ,7,7a,8,9,10,10aα,11,11aα - decahydro - 3-methoxy-7aβ-methyl-5H - cyclopenta<b>phenanthrene and 5,6,6a,7,7a,9-hexahydro-3-methoxy-7a-methyl-8H-cyclopenta<b>phenanthrene-8-ol acetate synthesized from m-methoxyphenylacetic acid.

3,646,115

PRODUCTION OF UNSATURATED ESTERS USING COMPLEXED CATALYSTS

Leon Starr, Plainfield, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Sept. 13, 1967, Ser. No. 667,379
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 5 Claims

Unsaturated esters are prepared by reacting an olefin with a monocarboxylic acid and oxygen in the presence of a complexed catalyst. The catalyst comprises a halide of Rh or Ir wherein the metal has a valence lower than maximum, complexed with carbon monoxide or trihydrocarbyl phosphines, arsines, or stibines or mixtures thereof. The unsaturated esters have many known uses, such as in preparing homopolymers and copolymers with other vinyl compounds in the coating field.

3,646,116

DIRECT PRODUCTION OF ESTERS FROM ETHYLENE AND METHANOL

James D. McClure, Oakland, and Lynn H. Slaugh, Lafayette, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Dec. 12, 1969, Ser. No. 884,719
Int. Cl. C07c *69/24*
U.S. Cl. 260—497 A 8 Claims

Methyl esters of linear saturated aliphatic acids are prepared in a single step process from ethylene and methanol.

3,646,117

NITROGEN-CONTAINING DERIVATIVES OF OLIGOMERS OF TETRAFLUOROETHYLENE AND HEXAFLUOROPROPENE

Harold Crosbie Fielding, Northwich, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Original application May 8, 1967, Ser. No. 636,675, now Patent No. 3,502,728, dated Mar. 24, 1970. Divided and this application Sept. 19, 1969, Ser. No. 870,789
Claims priority, application Great Britain, May 23, 1966, 22,866/66
Int. Cl. C07c *143/56*
U.S. Cl. 260—508 7 Claims

Preparation of nitrogen-containing derivatives of oligomers of tetrafluoroethylene and hexafluoropropene by refluxing an oligomer with a primary or secondary amine in an inert organic solvent whereby fluorine from the oligomer and amino nitrogen-attached hydrogen from the amine are eliminated as hydrogen fluoride and oligomer residue and amine residue become linked through the amino nitrogen atom. The derivatives have empirical formulae $QC—NR_1R_2$ or $QC{=}NR_2$ where QC is the oligomer residue and NR_1R_2 is the amino residue of the amine NHR_1R_2 in which R_1 and R_2 represent alkyl or aryl groups, which may be substituted, and R_1 can be hydrogen, and R_1 and R_2 can form part of a ring system. Preferred reaction solvents are 1,1,2-trifluoro-1,2,2-trichloroethane and methylene chloride, and typical oligomers are tetrafluoroethylene pentamer and hexafluoropropene trimer. Those oligomer derivatives whose R_1 and R_2 groups contain functional groups particularly sulphonic acid and carboxyl groups, and the corresponding salts and esters thereof, possess pronounced surface-active properties. Examples include derivatives made by reacting tetrafluoroethylene pentamer with diethylamine, allyamine, γ-diethylaminopropylamine, sodium p-aminobenzene sulphonic acid, piperazine, N-ethylethanolamine, and those

made by reacting respectively tetrafluoroethylene tetramer, pentamer and hexamer and hexafluoropropene trimer with the polyethylene glycol amino derivative

$$NH_2(CH_2CH_2O)_nCH_3$$

3,646,118
RESOLUTION PROCESS
Bernard Goffinet, Paris, and Antoine Locatelli, Rosny-sous-Bois, France, assignors to Roussel-UCLAF, Paris, France
No Drawing. Filed July 5, 1968, Ser. No. 742,532
Claims priority, application France, July 7, 1967, 113,581
Int. Cl. C07c *51/42, 61/16*
U.S. Cl. 260—514 P 2 Claims

A process for the recovery of d-trans-chrysanthemic acid from a mixture of dl-trans-cis-chrysanthemic acid with D(—)-threo-1-p-nitrophenyl-2-dimethylamino - propane-1,3-diol.

3,646,119
CARBONATION OF α,β-UNSATURATED CARBONYL COMPOUNDS
Robert Angelo Micheli, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed July 18, 1969, Ser. No. 860,453
Int. Cl. C07c *61/36*
U.S. Cl. 260—514 R 6 Claims

A general procedure for the carbonation of α,β-unsaturated carbonyl compounds utilizes a Group II*a* metal lower alkyl carbonate, e.g., magnesium methyl carbonate as the active reagent. Preferred embodiments relate to the carbonation of 5,6,7,7a - tetrahydro-substituted-5-oxo-indanes. The reaction is conducted generally in an inert organic solvent, preferably a non-protonic solvent, such as dimethylformamide or dimethylsulfoxide at elevated temperatures.

3,646,120
ASPHALTENE-DERIVED SURFACTANT COMPOSITION AND ITS PREPARATION
Armin C. Pitchford, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Feb. 7, 1969, Ser. No. 797,693
Int. Cl. C07c *63/00*
U.S. Cl. 260—515 R 19 Claims

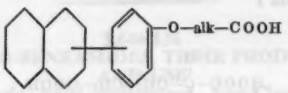
A novel surfactant composition is produced by reacting asphaltenes with an anhydride or halide of one or more of the following dicarboxylic acids: maleic acid, succinic acid and glutaric acid, with the reaction product then being separated and neutralized with a water-soluble oxide or hydroxide of a Group II–A metal. The surfactant composition formed is useful in the preparation of stable water-in-oil emulsions and also for dispersing solid particles in an oily medium.

3,646,121
4-BROMO-3-HYDROXYHIPPURIC ACID AND CATIONIC SALTS THEREOF
Leon Ellenbogen, New City, and Robert Gerard Kelly, Monsey, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Dec. 18, 1969, Ser. No. 886,405
Int. Cl. C07c *103/22*
U.S. Cl. 260—519 4 Claims

This disclosure describes 4-bromo-3-hydroxyhippuric acid and cationic salts thereof useful for inhibiting the formation of histamine in mammals.

3,646,122
DECAHYDRONAPHTHYL SUBSTITUTED PHENOXYALIPHATIC ACIDS
William Laszlo Bencze, New Providence, N.J., assignor to Ciba Corporation, Summit, N.J.
No Drawing. Continuation-in-part of application Ser. No. 718,374, Apr. 3, 1968. This application Jan. 27, 1969, Ser. No. 794,383
Int. Cl. C07c *65/14*
U.S. Cl. 260—520 5 Claims

Bicycloalkyl-phenoxy-aliphatic acids, e.g. those of the formula



alk=alkylene or alkenylene

and their functional derivatives are hypocholesterolemic agents.

3,646,123
PROCESS FOR THE CONTINUOUS OXIDATION OF METHYLBENZENE HYDROCARBONS BY NITROGEN DIOXIDE
William D. Vanderwerff, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Aug. 12, 1969, Ser. No. 849,496
Int. Cl. C07c *63/26*
U.S. Cl. 260—524 N 12 Claims

A continuous process for the oxidation of methyl-benzene hydrocarbons to benzenecarboxylic acids carried out at atmospheric pressure in the presence of an aromatic solvent and nitrogen dioxide.

3,646,124
PROCESS FOR PURIFICATION OF TEREPHTHALIC ACID OR ITS SALT
Willis C. Keith, Glenwood, and Carl E. Johnson, Matteson, Ill., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Jan. 23, 1969, Ser. No. 793,603
Int. Cl. C07c *51/48*
U.S. Cl. 260—525 14 Claims

An extraction process for the removal of impurities from terephthalic acid is disclosed. In this process an aqueous solution of a salt of terephthalic acid, for instance containing greater than about 1 weight percent of the salt, is extracted with n-butanol or benzyl alcohol at about 0 to 150° C., and the resulting phases separated to give an aqueous salt solution of increased purity. The terephthalic acid can be precipitated from solution by acidification. The alcohol to salt solution volume ratio in the extraction may often vary from about 1:5 to 15:1.

3,646,125
TEREPHTHALIC ACID PURIFICATION PROCESS
Jean Berthoux, Decines, and Bernard Ginet, Lyon, France, assignors to Progil, Paris, France
No Drawing. Filed Feb. 10, 1969, Ser. No. 798,129
Claims priority, application France, Feb. 26, 1968, 141,514
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 5 Claims

Terephthalic acid is purified by heating in a solvent which is a mixture of acetic acid, water and acetophenone and then recrystallizing. This treatment may be followed by further heating the purified acid in a saturated aliphatic monocarboxylic acid containing 2–5 carbon atoms and recrystallization.

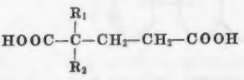
3,646,126

METHOD FOR THE PRODUCTION OF SUBSTITUTED GLUTARIC ACIDS

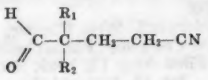
Hermann Richtzenhain, Schwellenbach, and Helmut aus der Funten, Mondorf, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

No Drawing. Filed Aug. 28, 1969, Ser. No. 853,921
Claims priority, application Germany, Sept. 4, 1968, P 17 93 350.5
Int. Cl. C07c *55/12, 55/02*
U.S. Cl. 260—530 R **5 Claims**

Method for the production of glutaric acids of the general Formula I



in which R_1 and R_2 signify alkyl groups with 1–4 C-atoms, or in which R_1 and R_2 together with the carbon atom to which they are attached can form a carbocyclic ring, by oxidation and saponification of cyano aldehydes of the general Formula II



in which R_1 and R_2 have the meaning indicated above which oxidation is carried out with chlorine and/or bromine in the presence of at least a stoichiometrical amount of water.

3,646,127

PROCESS FOR THE PREPARATION OF UNSATURATED CARBOXYLIC ACID

Shinichi Akiyama, Kamakura-shi, and Shoichiro Minami and Akinobu Toyoda, Yokohama-shi, Japan, assignors to The Japanese Geon Company, Ltd., Tokyo, Japan

No Drawing. Filed July 25, 1969, Ser. No. 845,052
Claims priority, application Japan, Aug. 1, 1968, 43/53,932
Int. Cl. C07c *57/04*
U.S. Cl. 260—530 N **6 Claims**

A process for the preparation of unsaturated carboxylic acids, which comprises catalytically reacting an unsaturated aldehyde with molecular oxygen at elevated temperatures in the vapor phase, in the presence of a catalyst comprising (a) molybdenum, (b) palladium or platinum, (c) silver, thorium, antimony, bismuth, chromium, selenium or tellurium, and (d) oxygen, as the essential components, and (e) phosphorus, boron, arsenic or silicon as an optional component.

3,646,128

OXIDATION OF BUTANE

Norman R. Cox and John B. Saunby, St. Albans, W. Va., assignors to Union Carbide Corporation

Continuation of application Ser. No. 474,699, July 26, 1965. This application May 23, 1969, Ser. No. 828,445
Int. Cl. C07c *49/10, 53/08*
U.S. Cl. 260—533 R **9 Claims**

In the liquid phase oxidation of butane the total productivity as well as the productivity of methyl ethyl ketone can be improved by treatment of recycle butane in order to reduce the concentration of carbon oxides, water and methyl ethyl ketone dissolved therein. Similar improvements can be achieved by recycling butane to the top rather than to the bottom of the reaction zone.

3,646,129

PROCESS FOR PREPARING SODIUM NITRILOTRIACETATE

James I. Nutter, Fairview, Pa., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of application Ser. No. 666,020, Sept. 7, 1967. This application July 14, 1969, Ser. No. 841,519
Int. Cl. C07c *101/20*
U.S. Cl. 260—534 E **10 Claims**

In abstract, this invention is directed to a process for precipitating sodium nitrilotriacetate from an aqueous solution thereof by adding sufficient ammonia to bring the ammonia concentration thereof to about 50–300 grams per liter of solution to precipitate sodium nitrilotriacetonitrile therefrom.

3,646,130

CATALYTIC OXIDATION OF CYCLODODECENE TO 1,12-DODECANEDIOIC ACID

George William Parshall, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 15, 1970, Ser. No. 37,928
Int. Cl. C07c *55/02*
U.S. Cl. 260—533 C **7 Claims**

1,12-dodecanedioic acid, which is a useful starting material for the preparation of fiber-forming polycarbonamides, of plasticizers, and of polyesters, is prepared by the oxidation of cyclododecene with hydrogen peroxide in the presence of rhenium heptoxide catalyst and of a lower carboxylic acid.

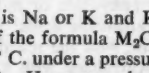
3,646,131

PROCESS FOR THE CARBOXYLATION OF COMPOUNDS HAVING A REPLACEABLE HYDROGEN ATOM

Takeo Ikarasi, Niigata-shi, Japan, assignor to Japan Gas-Chemical Company, Inc., Tokyo, Japan

No Drawing. Filed Mar. 19, 1969, Ser. No. 808,644
Claims priority, application Japan, Mar. 21, 1968, 43/18,439; Mar. 22, 1968, 43/18,686; Mar. 23, 1968, 43/18,772
Int. Cl. C07c *51/00, 51/52*
U.S. Cl. 260—537 R **10 Claims**

Carboxylation process comprising reacting a replaceable hydrogen-containing compound represented by the formula A—H wherein A is hydrogen or a COOM′ or



group in which M′ is Na or K and R_1 and R_2 are alkyl, with a compound of the formula M_2CO_3 (M is Na or K) and CO at 250–400° C. under a pressure of 100–1000 kg./cm.² to convert the A—H compound to a compound of the formula A·COOM.

3,646,132

DIACID BRIDGED-RING COMPOUNDS

David J. Trecker and Joseph P. Henry, South Charleston, and John W. Lynn, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Dec. 9, 1965, Ser. No. 520,298, now Patent No. 3,492,330, dated Jan. 27, 1970. Divided and this application July 30, 1969, Ser. No. 846,251
Int. Cl. C07c *61/12, 69/74*
U.S. Cl. 260—544 L **2 Claims**

A class of 2,5- and 2,6-diacid norbornane compounds and derivatives, e.g. 5(6)-chloroformyl-2-(chloroformylmethyl(norbornane, is produced by the free radical addition of a functionally substituted alkane to the unsaturated carbon atoms of a bridged-ring olefin. The functionally substituted alkane is free of non-benzenoid

carbon-to-carbon unsaturation and contains at least one hydrogen atom bonded to a carbon atom which, in turn is (i) a carbon atom of a functional substitutent or (ii) a carbon atom in a position alpha to the functional substituent. The norbornanes produced have the radical of the functionally substituted alkane bonded to the bridged-ring olefin moiety by a carbon-to-carbon bond. The products are useful in the manufacture of polymers.

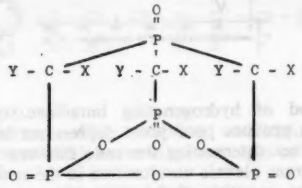
3,646,133

ANHYDRIDES OF ORGANO-ALKYLIDENE PHOSPHONYL PHOSPHINE OXIDES

Al F. Kerst, Denver, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 11, 1969, Ser. No. 832,491
Int. Cl. C07d *105/02*
U.S. Cl. 260—545 P **2 Claims**

This invention covers anhydrides of organo (alkylidene phosphonyl) phosphine oxides such as tris(alkylidene phosphonyl) phosphine oxide anhydride having the formula



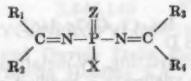
3,646,134

BIS-METHYLENE-AMIDES OF PHOSPHORIC ACIDS AND THEIR THIO-DERIVATIVES

Klaus Hunger, Kelkheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 4, 1969, Ser. No. 796,581
Claims priority, application Germany, Nov. 28, 1968, P 18 11 351.4, P 18 11 352.5
Int. Cl. C07f *9/22, 9/24, 9/44*
U.S. Cl. 260—551 P **5 Claims**

Bis-methylene amides of phosphoric or phosphoric acid, and their thio derivatives, useful as lubricant additives having antioxidant and thermal-stabilizing properties, of the formula



wherein R_1–R_4, taken alone, are the same or different and are alkyl, cyclohexyl, phenyl, mono- or di-chloro- or bromophenyl, or alkylphenyl; or R_1 and R_2, taken together, or R_3 and R_4, taken together, are alkylene; X is alkyl, cyclohexyl, phenyl, or alkylphenyl bound directly to carbon or by way of an oxygen or sulfur atom, or morpholino or dialkylamino; and Z is oxygen or sulfur. Methods of making said compounds by reacting a ketamine or mixture of ketamines with a compound of the formula

where Y is chlorine or bromine, of with a compound of the formula

to form an intermediate which is subsequently oxidized with oxygen or sulfur. Specific bis-methylenes of a phosphonic acid in which X is hydrocarbyl or dialkylamino.

3,646,135

UREA DYES

Robert F. Coles, East Oakdale Township, Washington County, and Norman P. Sweeny, North Oaks Village, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Sept. 18, 1967, Ser. No. 668,708
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 A **13 Claims**

Novel protonatable color precursors are produced by reaction of auramine with alkyl or aryl isocyanates.

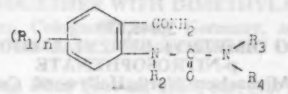
3,646,136

2-UREIDO-BENZAMIDES, THEIR PRODUCTION AND USE

Karl Hoegerle, Basel, Switzerland, Jean-Claude Muller, St. Louis, France, and Christian Vogel and Jurg Rumpf, Binningen, near Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Mar. 24, 1969, Ser. No. 809,978
Claims priority, application Switzerland, Mar. 29, 1968, 4,710/68
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 A **2 Claims**

2-ureido-benzamides of the formula



wherein

R_1 represents halogen, lower alkyl or lower alkoxy of at most 5 carbon atoms,

R_2 represents hydrogen or lower alkyl of at most 5 carbon atoms,

R_3 represents hydrogen, lower alkyl or lower alkoxy of at most 5 carbon atoms,

R represents an alkyl, alkenyl or alkinyl radical with at most 8 carbon atoms, lower halogen-alkyl, alkoxyalkyl or alkylmercaptoalkyl of at most 5 carbon atoms or cycloalkyl having 3 to 10 carbon atoms as ring members, and

n represents a whole number from 0 to 3,

are disclosed as herbicidally active compounds of enhanced toxicity to undesirable plant growth and improved selectivity. A method for controlling undesirable plant growth with such compounds and compositions containing them as active ingredients are also disclosed.

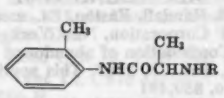
3,646,137

SUBSTITUTED TOLUIDIDES AND COMPOSITIONS CONTAINING THEM

Charles L. M. Brown, Epsom, England, assignor to Wigglesworth Limited, Westhoughton, England

No Drawing. Original application June 20, 1966, Ser. No. 558,626, now Patent No. 3,544,587, dated Dec. 1, 1970. Divided and this application May 21, 1970, Ser. No. 39,548
Int. Cl. C07c *103/44*
U.S. Cl. 260—557 R **9 Claims**

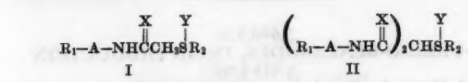
This invention relates to a class of aminopropionyl-o-toluidides and their acid addition salts which are useful as local anaesthetics. The toluidides have the general formula:



in which R represents a cycloalkyl ring which may have alkyl substituents and which contains a total of 3 to 5 carbon atoms in the ring.

3,646,138
β-AMIDOSULFOXIDES
Maximilian von Strandtmann, Rockaway, and Sylvester Klutchko, Hackettstown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
No Drawing. Continuation-in-part of application Ser. No. 843,800, July 22, 1969. This application Mar. 12, 1970, Ser. No. 19,106
Int. Cl. C07c *103/33*
U.S. Cl. 260—558 S 8 Claims

The present invention is concerned with β-amidosulfoxides of Formulas I and II:



wherein X is oxygen or sulfur; Y is O or O_2; A is alkyl, cycloalkyl, substituted phenyl, naphthyl, biphenyl, heteroaryl or aralkyl; R_1 is hydrogen, lower alkyl, lower alkoxy, halo or nitro; R_2 is methyl, aryl, heteroaryl or arylmethylene.

The compounds of this invention possess sedative-hypnotic properties.

3,646,139
COCO DIMETHYL BENZYL AMMONIUM p-NITROSOPHENATE
Joseph B. Michaelson, North Hollywood, Calif., assignor to Applied Biological Sciences Laboratory, Inc., Glendale, Calif.
No Drawing. Original application Aug. 9, 1967, Ser. No. 659,320, now Patent No. 3,551,334, dated Dec. 29, 1970. Divided and this application Dec. 30, 1969, Ser. No. 1,911
Int. Cl. C07c *87/30*
U.S. Cl. 260—567.5 1 Claim

A new compound, coco dimethyl benzyl ammonium p-nitrosophenate is disclosed. Useful as a bacteriocide, especially against Desulfovibrio desulfuricans, the compound may be mixed with fresh or saline water to be used for secondary oil recovery operations to prevent biosynthetic generation of hydrogen sulfide during such operations.

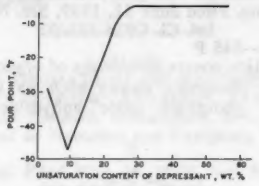
3,646,140
HEXA-ALKYL-ALKYLENEDIAMINE DIQUARTERNARY DIHALIDE HALOGEN COMPLEXES AND THEIR USE
Robert M. Thomas, Fred R. Gerns, and John L. Sands, West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.
No Drawing. Continuation-in-part of application Ser. No. 770,063, Oct. 23, 1968. This application Mar. 3, 1970, Ser. No. 16,215
Int. Cl. C07c *87/30*
U.S. Cl. 260—567.6 P 7 Claims

Halogen complexes of hexa-alkyl-alkylenediamine diquaternary dihalides are halogenating, defoliant, bacteriocidal and herbicidal agents.

3,646,141
HALOHYDROXYACRYLAMIDES AND PROCESS FOR MAKING SAME
David I. Randall, Easton, Pa., assignor to GAF Corporation, New York, N.Y.
No Drawing. Continuation of abandoned application Ser. No. 617,821, Feb. 28, 1967. This application Sept. 18, 1969, Ser. No. 859,491
Int. Cl. C07c *103/58*
U.S. Cl. 260—562 B 8 Claims

The compounds are of the class of 2-halo-3-hydroxyacrylamides, a species being 2,3',4'-trichloro-3-hydroxyacrylanilide, useful as herbicides, fungicides, corrosion inhibitors, antioxidants and additives for lube oils.

3,646,142
HYDROGENATION OF POLYMERS
Charles W. Strobel, Borger, Tex., assignor to Phillips Petroleum Company
Filed Nov. 12, 1969, Ser. No. 875,671
Int. Cl. C07c *15/10*
U.S. Cl. 260—669 P 10 Claims



A method of hydrogenating butadiene/styrene copolymers to produce pour point depressants is disclosed which involves determining the ratio between the quantity of the trans olefinic unsaturation in the reaction mixture and the quantity of the phenyl group within the reaction mixture and recovering the product depressant when the ratio between the two quantities corresponds to the desired pour point effectiveness, the quantitative determinations being preferably determined by infrared analysis.

3,646,143
PROCESS FOR CONVERTING AN OLEFIN TO A PRODUCT CONTAINING HIGHER AND LOWER OLEFINS
Alan F. Ellis, Murrysville, and Edward T. Sabourin, Allison Park, Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.
No Drawing. Continuation-in-part of application Ser. No. 821,945, May 5, 1969. This application Aug. 25, 1969, Ser. No. 852,878
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D 16 Claims

A process for converting, by metathesis, an olefin, particularly an alpha olefin, to a product containing a mixture of olefins of higher and lower carbon number than the olefin charge, which involves contacting the olefin charge with a novel composition containing (1) alumina, (2) cobalt, (3) molybdenum, and (4) silver or copper.

3,646,144
DRUG WITH HYPERTENSIVE ACTION ON THE BASE OF 1-(3,4 - DIMETHOXY - 4-HYDROXYPHENYL)-2-MONOMETHYLAMINOETHANOL
Mario Giani, Milan, Luigi Molteni, Malnate, Varese, and Enzo Gori, Milan, Italy, assignors to Dr. L. Zambeletti S.p.A., Milan, Italy
Filed Oct. 25, 1967, Ser. No. 680,611
Claims priority, application Italy, May 11, 1967, 15,981/67
Int. Cl. C07c *91/34*
U.S. Cl. 260—570.6 1 Claim

1 - (3,5 - dialkoxy - 4 - hydroxyphenyl)-2-monoalkylaminoalkanols and especially 1 - (3,5 - dimethoxy-4-hydroxyphenyl)-2-monomethylaminoethanol can be profitably employed in therapy as drugs with hypertensive action. The preferred compound has evidenced an unequivo-

cal hypertensive effect through oral, intramuscular or endovenous way. It can be obtained from acetylsyringic acid chloride via diazoketone, chloroketone reaction of the latter with monomethylamine and catalytic reduction.

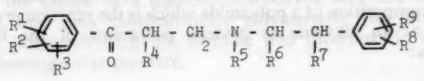
3,646,145

N-(1-HYDROXY-1-PHENYL-ETHYL AMINO)-PROPIOPHENONES

Kurt Thiele, Frankfurt am Main, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed July 1, 1968, Ser. No. 741,283
Claims priority, application Germany, June 29, 1967, P 15 93 837.1
Int. Cl. C07c *91/02*
U.S. Cl. 260—570.5 C 6 Claims

Compounds of the formula



in which:

R^1 is fluorine, —CN, —COOH, —COOAlk, wherein Alk is lower alkyl, lower alkyl mercapto or lower alkyl sulfonyl;
R^2 and R^3 are each selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl, lower alkoxy and hydroxy;
R^4 is hydrogen, methyl or ethyl;
R^5 is hydrogen or lower alkyl;
R^6 is hydrogen or lower alkyl;
R^7 is hydrogen or hydroxy and
R^8 and R^9 are hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy
and their pharmacologically acceptable acid addition and quaternary ammonium salts which have heart activity, particularly in increasing coronary blood flow and contraction amplitude.

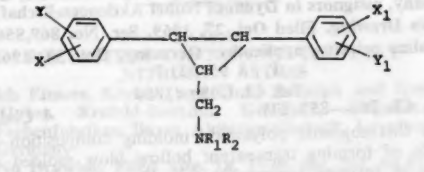
3,646,146

DIPHENYLCYCLOPROPYL-METHYL-AMINES

Uberto Teotino and Davide Della Bella, Milan, Italy, assignors to Whitefin Holding S.A., Lugano, Switzerland

No Drawing. Filed Jan. 17, 1967, Ser. No. 609,771
Int. Cl. C07c *87/32*
U.S. Cl. 260—570.5 CA 8 Claims

Diphenylcyclopropyl-methyl-amines having fairly low toxicity and serving as central nervous system stimulants with marked anti-depressant activity, represented by the formula:



wherein X, Y, X_1, Y_1 are members selected from the group consisting of hydrogen, methyl and methoxy; R_1 is a hydrogen atom or an alkyl radical containing from 1 to 4 carbon atoms; R_2 is hydrogen atom or alkyl radical containing from 1 to 4 carbon atoms, dimethylaminoethyl, dimethylaminopropyl, methylaminopropyl, 2,3-diphenyl-cyclopropane-1-methyl, cyclohexyl radicals and their pharmaceutically acceptable salts with organic and inorganic acids.

3,646,147

TWO-PHASE IODIDE-CATALYSED SYSTEM FOR PREPARING TERTIARY AMINES

Zaven A. Dadekian, Suffern, N.Y., assignor to Baird Chemical Industries, Inc., New York, N.Y.

No Drawing. Continuation of application Ser. No. 617,805, Feb. 23, 1967. This application Mar. 18, 1970, Ser. No. 19,533
Int. Cl. C07c *85/04*
U.S. Cl. 260—583 R 13 Claims

Tertiary amines are prepared by reacting an alkyl chloride with a lower amine in a two-phase system using an ammonia or alkali metal iodide catalyst.

3,646,148

PROCESS FOR THE PRODUCTION OF METHYLAMINE TOGETHER WITH DIMETHYLAMINE

Edgar Enders, Cologne-Flittard, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,100
Claims priority, application Germany, Mar. 5, 1968, P 16 68 907.9
Int. Cl. C07c *85/00, 87/08*
U.S. Cl. 260—583 J 10 Claims

Process for producing methylamine and dimethylamine by passing a mixture of carbon monoxide, hydrogen and nitrogen over a catalyst containing uranium or thorium at a temperature of from about 300° to about 600° C.

3,646,149

PROCESS FOR THE PREPARATION OF CANTHAXANTHINE

Jacques Morel, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Aug. 23, 1968, Ser. No. 754,996
Claims priority, application France, Aug. 28, 1967, 119,189
Int. Cl. C07c *45/04, 49/36*
U.S. Cl. 260—586 B 10 Claims

Canthaxanthine, useful as a colouring agent for foods, may be made by oxidizing β-carotene or retrodehydro-β-carotene with a metaperiodate and, as catalyst, a halogen or a metal oxide of Group V–A, VI–A, VII–A, or VIII of the Periodic Table.

3,646,150

PREPARATION OF CYCLOBUTANONE BY CYCLO-ADDITION OF ETHYLENE AND KETENE

Henry K. Hall, Jr., and Donald E. Plorde, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 10, 1968, Ser. No. 766,623
Int. Cl. C07c *45/00*
U.S. Cl. 260—586 R 1 Claim

Disclosed herein is a process of preparing cyclobutanone by the thermal cycloaddition of monomeric ketene and ethylene.

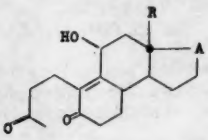
3,646,151

TRICYCLIC COMPOUNDS AND PROCESS

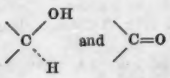
Jacques Prost Marechal, Paris, and Georges Tomasik, Rosny-sous-Bois, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,554
Claims priority, application France, Jan. 26, 1968, 137,630
Int. Cl. C07c *49/44*
U.S. Cl. 260—586 10 Claims

13β-R-4,5-seco-Δ^9-gonene-3,5-diones of the formula



wherein R represents an alkyl having 1 to 4 carbon atoms and A represents a member selected from the group consisting of



as well as a process for their preparation. The novel compounds are useful as intermediates in the production of known steroids having useful physiological properties.

3,646,152

METHOD OF PREPARING AN ALUMINA CATALYST CONTAINING CHLORINE AND ISOMERIZATION PROCESS UTILIZING THE SAME

Robert M. Suggitt and John H. Estes, Wappingers Falls, and Stanley Kravitz, Wiccopee, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed May 12, 1969, Ser. No. 823,970
Int. Cl. C07c *5/30*; B01j *11/78*
U.S. Cl. 260—683.68 11 Claims

A hydrocarbon containing 4 to 7 carbon atoms is isomerized with an alumina catalyst containing chlorine and which may also include a metal from the group; ruthenium, rhodium, palladium and platinum. The chlorine is introduced to the alumina in amounts of 3–12% by contacting the alumina with a combination of molecular chlorine and an organic compound, such as formaldehyde, methyl alcohol or methyl mercaptan, at 400–750° F.

3,646,153

SYNTHETIC FIBERS HAVING IMPROVED SOIL AND STAIN REPELLENCY

Bryce C. Oxenrider, Florham Park, and Cyril Woolf, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 17, 1969, Ser. No. 867,368
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 S 5 Claims

The soil and stain repellency of extruded filaments of a synthetic resin can be improved by incorporating in the resin a small amount, about 1%, of an amphiphatic compound having from one to four fluoroalkyl groups pendent from an organic radical. The repellency is provided by the fluoroalkyl groups, which tend to be concentrated at the surface of the fiber.

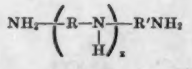
3,646,154

HOT MELT ADHESIVE CONTAINING POLYAMIDE AND ETHYLENE-VINYL ACETATE COPOLYMER

Nelson S. Marans and Victor S. Frank, Silver Spring, Md., assignors to W. R. Grace & Co.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,096
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 L 8 Claims

This invention relates to a hot melt adhesive resin composition which can be set by heat and pressure to bond to solid surfaces. The adhesive composition consists essentially of an ethylene-containing polar copolymer or terpolymer in combination with 10–60% by weight of the composition of a polyamide which is the reaction product of an alkylene or arylene polyamine of the formula:



wherein R and R′ are alkylene, arylalkylene and arylene and x is 0 to 3, and an alkylene dicarboxylic acid or its esters. The adhesive can be used to bond metal, ceramic, leather, paper, wood, plastic and other surfaces.

3,646,155

CROSS-LINKING OF A POLYOLEFIN WITH A SILANE

Henry George Scott, Glamorgan, Wales, assignor to Midland Silicones Limited, Reading, Berkshire, England

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,346
Claims priority, application Great Britain, Dec. 20, 1968, 60,650/68
Int. Cl. C08f *29/12*; C08g *47/10*
U.S. Cl. 260—827 9 Claims

Polyolefins are cross-linked by reaction of the polyolefin with an unsaturated hydrolysable silane at a temperature above 140° C. and in the presence of a compound capable of generating free radical sites in the polyolefin, and subsequent exposure of this product to moisture and a condensation catalyst.

3,646,156

POLYAMIDE CONTAINERS OF 2,2,4 AND/OR 2,4,4 TRI-METHYL HEXAMETHYLENE DIAMINE

Johannes Schneider and Wolfgang Pungs, Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft

No Drawing. Filed Oct. 27, 1969, Ser. No. 869,856
Claims priority, application Germany, Oct. 30, 1968, P 18 05 921.7
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 TW 4 Claims

A thermoplastic polyamide molding composition capable of forming transparent hollow blow molded objects at forming temperatures in the range of 170 to 230° C., comprises:

(a) at least 40 weight percent of an amorphous polyamide composed of an aromatic dicarboxylic acid, a trimethyl hexamethylene diamine and a normal aliphatic diamine, the normal aliphatic diamine com-

prising up to 30 weight percent of the diamines used, and

(b) the balance, aside from customary additives, of a second polyamide formed from a ω-amino acid or ω-lactam, or formed from an aliphatic dicarboxylic acid and a normal aliphatic diamine.

3,646,157

THERMOPLASTIC COMPOSITIONS BASED ON POLYOLEFINES AND POLYAMIDES

Pierre Grosjean, Sainte-Foye-les-Lyon, and Alain Palsky, Caluire, Rhone, France, assignors to Societe Rhodiaceta, Paris, France

No Drawing. Filed Mar. 21, 1969, Ser. No. 809,384
Claims priority, application France, Mar. 22, 1968, 145,008
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 L **3 Claims**

Thermoplastic compositions consisting of polyolefines very finely dispersed in polyamides are made by dispersing the olefine in a diamine-dicarboxylic acid salt solution, and then simultaneously polymerizing the olefine and polycondensing the diamine and dicarboxylic acid by heating under pressure.

3,646,158

FILM OF POLYURETHANE AND ETHYLENE-ACRYLIC ACID INTERPOLYMER

Albert L. Eustice, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Original application Apr. 2, 1968, Ser. No. 718,043. Divided and this application Nov. 12, 1970, Ser. No. 88,856
Int. Cl. C08g *41/04*
U.S. Cl. 260—859 R **4 Claims**

A film is provided which comprises a dispersion of pre-cured polyurethane in acidic copolymer having its main polymer chain saturated and of carbon atoms, a portion of which are substituted with an adhesively effective amount of carboxylic acid groups. The film can be used as an interlayer between a base panel and a constraining sheet to form a constrained layer damped structure, with the acidic copolymer serving to adhere the film to the panel and the sheet.

3,646,159

POLYCARBONATE/POLYACETAL THERMOPLASTIC RESIN COMPOSITIONS

Gerald W. Miller, Pittsburgh, Pa., assignor to Baychem Corporation, New York, N.Y.

No Drawing. Filed Mar. 13, 1968, Ser. No. 712,615
Int. Cl. C08f *29/30, 45/34*; C08g *39/10*
U.S. Cl. 260—860 **9 Claims**

Blends of polycarbonates with polyacetals wherein the polyacetal is present in the blend at a concentration sufficient to impart thereto a resistance to environmental stress crazing and cracking greater than that possessed by the polycarbonate itself.

3,646,160

POLYESTERS CONTAINING TERTIARY NITROGEN ATOMS

Erich Eimers, Krefeld, and Hans Rudolph and Werner Kloker, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 18, 1970, Ser. No. 64,822
Claims priority, application Germany, Aug. 29, 1969, P 19 43 954.4
Int. Cl. C08f *21/02*
U.S. Cl. 260—864 **3 Claims**

The invention relates to novel linear polyesters containing hydroxy end groups and an N,N-bis-(β-sec.hydroxyalkyl)-p-alkylphenylamine and certain dicarboxylic acids condensed therein. These novel polyesters are useful as accelerators for mixtures of unsaturated polyesters and copolymerizable monomers which harden at room temperature after the addition of a diacyl peroxide catalyst.

3,646,161

SYNTHETIC RUBBER MIXTURES OF BUTADIENE/STYRENE BLOCK COPOLYMERS

Gunter Marwede and Gottfried Pampus, Leverkusen, and Martin Hoffmann, Bergisch-Gladbach, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 8, 1969, Ser. No. 823,187
Claims priority, application Germany, May 14, 1968, P 17 70 407.3
Int. Cl. C08f *29/12, 33/08*
U.S. Cl. 260—876 B **4 Claims**

Synthetic rubber mixture comprising:

(a) from 10% to 90% by weight of one or more uniform butadiene/styrene block copolymers with a molecular weight of from 30,000 to 150,000, a viscosity [η] measured in toluene of from 0.5 to 2 dl./g. and a styrene content of from 20% to 50% by weight; and

(b) from 90% to 10% by weight of one or more uniform butadiene/styrene block copolymers with a molecular weight of from 100,000 to 1,000,000, a viscosity [η] measured in toluene of from 1.5 to 10 dl./g. and a styrene content of from 0.3 to 20% by weight.

3,646,162

THERMOPLASTIC RESIN BLENDS OF POLYSULFONE AND A GRAFT DERIVATIVE OF A BUTADIENE CONTAINING POLYMER SPINE

Robert L. Lauchlan, Granger, Ind., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed July 15, 1969, Ser. No. 842,002
Int. Cl. C08f *37/18, 41/12*
U.S. Cl. 260—876 R **4 Claims**

Blends of thermoplastic polysulfone resin and a graft derivative of a butadiene containing polymer spine are characterized by an unusually useful combination of properties, particularly low temperature melt processability in combination with high impact strength and flexural strength.

3,646,163

SHAPING COMPOSITION OF CHLORINATED POLYVINYL CHLORIDE HAVING IMPROVED HEAT COLORATION

Susumu Taima, Uozu-shi, and Saiji Nozaki, Unazuki-machi, Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of application Ser. No. 620,479, Mar. 3, 1967. This application Oct. 15, 1969, Ser. No. 866,509
Claims priority, application Japan, Mar. 5, 1966, 41/13,150
Int. Cl. C08f *41/12*
U.S. Cl. 260—876 R **4 Claims**

A chlorinated polyvinyl chloride composition for shaping having a markedly improved heat coloration property without substantially lowering the improved heat-softening point inherently possessed by chlorinated polyvinyl chloride, such composition comprising 100 parts by weight of chlorinated polyvinyl chloride with a chlorine content of not less than 60% by weight and 3–40 parts by weight of a butadiene-styrene-methylmethacrylate copolymer blended therewith. The copolymer consists of above 1% and up to 70% by weight of methyl methacry-

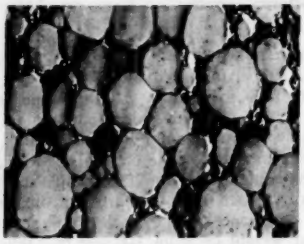
late, 1–95% by weight of butadiene and 3–65% by weight of styrene the sum of these three components being 100% by weight.

3,646,164

IMPACT RESISTANT COMPOSITIONS COMPRISING METHYL METHACRYLATE, DIALLYL PHTHALATE AND AN ETHYLENE COPOLYMER

William George Deichert, Durham, N.H., and Richard Ronald Lemay, Meriden, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 11, 1970, Ser. No. 71,318
Int. Cl. C08f *25/00, 37/00*
U.S. Cl. 260—878 R 7 Claims



Castable compositions of matter comprising (1) a monomeric mixture of methyl methacrylate and diallyl phthalate with or without comonomers copolymerizable therewith and (2) a copolymer of ethylene, castings thereof and a method for the production thereof, are disclosed.

3,646,165

PROCESSES FOR GRAFTING UNSATURATED ACIDS OR ESTERS ON POLYETHYLENE

Claude Favie, Billere, and Werner Dellsperger and Philippe Meline, Pau, France, assignors to Societe Anonyme dite, Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

No Drawing. Filed June 27, 1969, Ser. No. 837,328
Claims priority, application France, June 28, 1968, 157,143, 157,145
Int. Cl. C08f *1/13, 15/00*
U.S. Cl. 260—878 R 16 Claims

One or more monomers selected from polymerisable unsaturated acids and esters is or are grafted onto non-preactivated polyethylene in aqueous suspension by first dissolving each monomer to be grafted in the polyethylene suspension and then subjecting the latter to the action of a chemical producer of free radicals at a temperature which is lower than the fusion point of the polyethylene.

3,646,166

BUTYL RUBBER REACTION PRODUCTS

Nathan H. Canter, Edison, and Joseph P. Kennedy, Cranford, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed May 27, 1970, Ser. No. 41,087
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—879 15 Claims

Ionic crosslinking is introduced into an uncured butyl rubber by halogenation of butyl rubber, dehydrohalogenation to form conjugated double bonds and reaction of an ethylenically unsaturated compound such as maleic anhydride with this conjugated double bond system to form a graft polymer. The graft polymer is then reacted with a metallic salt or an amine to form an ionic hydrocarbon polymer useful for molded or extruded products.

3,646,167

BLOCK COPOLYMERS CONTAINING A POLYETHYLENE SULFIDE BLOCK

George A. Pope, Clarkson, Ontario, Canada, and Peter T. Hale, Erdington, Birmingham, and David A. Bird, Walmley, Sutton, Coldfield, England, assignors to The Dunlop Company Limited, London, England

No Drawing. Filed Feb. 28, 1969, Ser. No. 803,407
Claims priority, application Great Britain, Mar. 5, 1968, 10,539/68
Int. Cl. C08f *15/04*
U.S. Cl. 260—879 11 Claims

A block copolymer having a configuration A, B, C, in which A is a block of a relatively rigid polymer having an average molecular weight of from 5,000 to 50,000. B is an elastomeric block having an average molecular weight of from 20,000 to 400,000 and C is a crystalline block having a molecular weight of from 300 to 20,000.

3,646,168

OIL AND OZONE RESISTANT ELASTOMER BLENDS COMPRISING EPDM RUBBER

Robert E. Barrett, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

No Drawing. Continuation-in-part of application Ser. No. 575,972, Aug. 30, 1966, now Patent No. 3,492,371, which is a continuation-in-part of application Ser. No. 551,517, May 20, 1966. This application Jan. 22, 1970, Ser. No. 5,155
Int. Cl. C08f *37/18;* C08d *9/08*
U.S. Cl. 260—889 31 Claims

A rubber composition having good oil and ozone resistance formed of a curable blend of rubbery polymer and an EPDM copolymer formed by interpolymerization of monomers including a 5-alkylidene-2-norbornene having at least 2 carbon atoms in the alkylidene group and having an effective unsaturation of at least 2 carbon-to-carbon double bonds per 1000 carbon atoms in the interpolymer.

3,646,169

SULFUR VULCANIZABLE ELASTOMERIC BLENDS COMPRISING DIOLEFIN RUBBER AND EPDM THERPOLYMERS

Kenneth H. Wirth, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton, Rouge, La.

No Drawing. Continuation-in-part of application Ser. No. 548,614, May 9, 1966, now Patent No. 3,492,370. This application Jan. 22, 1970, Ser. No. 5,117
Int. Cl. C08f *29/12, 41/12;* C08d *9/08*
U.S. Cl. 260—889 26 Claims

This invention relates to sulfur vulcanizable blends prepared from a diolefin rubber and an interpolymer comprising ethylene, at least one straight chain monoolefin containing 3–16 carbon atoms and a polyunsaturated bridged ring hydrocarbon containing at least one ethylenic double bond in one of the bridged rings. The blends are particularly useful as adhesives in the preparation of rubber laminates.

3,646,170

DISPERSIONS OF CYCLIC ESTER/ALKYLENE OXIDE COPOLYMERS WITH A POLYMERIC DISPERSING AGENT

Robert Dean Lundberg, Somerville, N.J., and Frank Paul Del Giudice, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,322
Int. Cl. C08g *17/017*
U.S. Cl. 260—899 8 Claims

Dispersions of linear cyclic ester/alkylene oxide copolymers are produced by reacting an admixture comprising cyclic ester and alkylene oxide monomers, interfacial agent and catalyst, in the presence of certain inert organic vehicles.

3,646,171

BIS-[α-(THIO) PHOSPHORYL OXIMINO]-PHENYLENE-1,4-BIS-ACETIC ACID NITRILES

Walter Lorenz, Wuppertal-Vohwinkel, Günter Unterstenhöfer, Opladen, and Ingebord Hammann, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 23, 1968, Ser. No. 707,394
Claims priority, application Germany, Mar. 1, 1967, F 51,673
Int. Cl. A01n *9/36*; C07f *9/06*
U.S. Cl. 260—926 8 Claims

Bis-[α-(O-alkyl-O-alkyl - phosphoryl and -thinophosphoryl, and alkyl-O-alkyl-phosphonyl and -thionophosphonyl)-oximinol]-phenylene-1,4-bis - acetic acid nitriles which possess pesticidal, especially acaricidal and insecticidal, properties and which may be produced by reacting the corresponding phosphoric (phosphonic) and thiono-phosphoric (-phosphonic) acid ester halide with α, α-'dioximino-phenylene-1,4-bis-acetic acid nitrile.

3,646,172

1 - (O,O - DIORGANOPHOSPHORODITHIATO) ALKYL CARBOXYLATES AND PROCESS FOR MAKING SAME

Herbert Myers, Philadelphia, Pa., assignor to Mobil Oil Corporation

No Drawing. Original application Apr. 5, 1965, Ser. No. 445,697, now Patent No. 3,350,348, dated Oct. 31, 1967. Divided and this application Sept. 8, 1967, Ser. No. 666,464
Int. Cl. C07f *9/08*; B01j *1/16*
U.S. Cl. 260—928 22 Claims

1 - (O,O-diorganophosphorodithiato)alkyl carboxylates are prepared by reacting an O,O-diorganophosphorodithioic acid with a vinyl carboxylate. These products have utility in inhibiting oxidation and preventing metal corrosion when used in a variety of industral organic media.

3,646,173

PROCESS FOR PREPARING BISPHOSPHITE ESTERS OF ALKYLIDENE DIPHENOL

Irving Gordon, Niagara Falls, James J. Hodan, Williamsville, and James L. Dever, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 466,466, June 23, 1965. This application May 29, 1969, Ser. No. 829,128
Int. Cl. C07f *9/12*; C08d *11/04*
U.S. Cl. 260—976 4 Claims

Bisphosphite esters of Bisphenol F are made by reacting an aryl hydroxy compound with formaldehyde in the presence of an acid catalyst, to form a dihydroxy compound condensation product, providing a mixture of such condensation product and an aryl hydroxy compound, and reacting phosphorus trihalide with the mixture to produce the desired bisphosphite. The bisphosphites made are useful for stabilizing rubber compositions against the adverse effect of heat.

3,646,174

PROCESS FOR MAKING SPHEROIDAL AGGLOMERATES

Bruno J. Macri, Springfield, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.

No Drawing. Filed Dec. 12, 1969, Ser. No. 884,697
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 C 14 Claims

Process for making spheroidal agglomerates of particulate solids, such as metallic materials, bonded by a matrix of an organic polymer, which comprises mixing the solid particles with an organic liquid prepolymer curable to a solid polymer, and a volatile liquid which is immiscible with the prepolymer and does not dissolve the solid particles; and continuously agitating the resulting mixture while removing the volatile liquid. During such simultaneous agitation and removal, the prepolymer and solids coalesce into globules containing the particles dispersed therein. The agitation and removal continues until the prepolymer cures into a solid polymer. By liquid "prepolymer" is meant a liquid polymer which is further curable into a higher molecular weight or crosslinked solid polymer. Cure of the prepolymer can be accomplished thermally and/or by addition of curing agent. It is generally preferred to include curing agent in the process mixture.

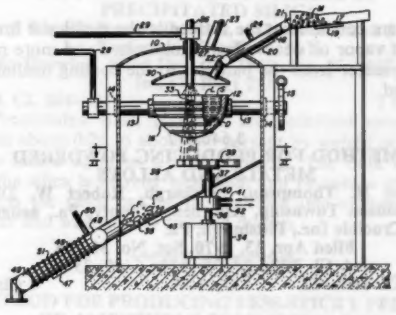
The solid particles may be the same or different substances. If different, they are intimately admixed in each agglomerate spheroidal particle in desired ratios of concentration.

3,646,175

METHOD AND APPARATUS FOR CONVERTING MISCELLANEOUS PIECES OF REACTIVE METALS TO A USABLE FORM

Howard B. Bomberger, Jr., and Harold D. Kessler, Canfield, Ohio, assignors to RMI Company, Niles, Ohio

Continuation of application Ser. No. 726,400, May 3, 1968. This application Sept. 21, 1970, Ser. No. 74,201
Int. Cl. B22f *9/00*
U.S. Cl. 264—8 10 Claims



Pieces of a reactive metal, such as titanium or zirconium, are melted on a hearth within a chamber which is evacuated or filled with inert gas. Stream of molten metal overflows the hearth and is acted on by a mechanism which disperses it into small particles. The particles solidify as pellets and/or flakes which are readily blended with sponge metal and used in making up a melting charge. Dense inclusions in the starting material sink to the bottom of the hearth and thus are eliminated from the product.

3,646,176

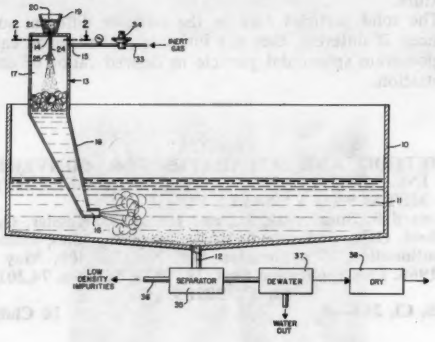
METHOD FOR PRODUCING LOW OXIDE METAL POWDERS

Maurice Donald Ayers, Stamford, Conn., assignor to Metal Innovations, Inc., Stamford, Conn.

Filed Sept. 4, 1969, Ser. No. 855,096
Int. Cl. B01j *2/06*
U.S. Cl. 264—11 4 Claims

A method is disclosed for producing high purity metal powders having an irregular and angular shape and a very low oxygen content (less than 0.25% oxygen in iron and steel powders). The invention utilizes a high pressure liquid atomization procedure for converting the molten metal to angular particulate form, and provides for the very rapid subsequent cooling of the hot particles under conditions of high pressure sprays and violent turbulence

of the powder particles in the liquid that minimize the formation of oxide impurities on the particle surface. High pressure atomization to produce angular and irregular particles tends to create an oxidizing environment because of the mixture of hot particles and liquid. By rapidly quenching the particles immediately after formation, in a quenching environment that creates a violently



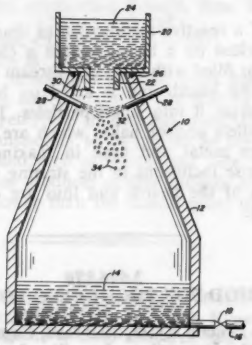
turbulent condition at the surface of the metal, the formation of vapor or steam films is minimized and more rapid heat transfer from the particles to the cooling medium is realized.

3,646,177

METHOD FOR PRODUCING POWDERED METALS AND ALLOYS

Vernon R. Thompson, Pittsburgh, Robert W. Diehl, Robinson Township, Allegheny County, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Filed Apr. 23, 1970, Ser. No. 31,105
Int. Cl. B22d *23/08;* **B29c** *6/00, 23/00*
U.S. Cl. 264—12 **4 Claims**



Method for producing powdered metals and alloys that are free from oxidation comprising atomizing molten metal with a fluid jet to form discrete particles thereof, directing said atomized particles to a collecting chamber having therein a reservoir of an inert cryogenic liquid, such as liquid nitrogen, depositing said particles in said liquid to cool the particles and at the same time protect them against oxidation during cooling.

3,646,178

METHOD OF PREPARING MICROPOROUS SHEET STRUCTURES

Harro Traübel, Leverkusen, Bruno Zorn, Cologne-Flittard, and Klaus König and Wolfgang Heydkamp, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 26, 1969, Ser. No. 810,839
Claims priority, application Germany, Apr. 2, 1968, P 17 69 089.0
Int. Cl. B29d *27/04;* **C08g** *41/04*
U.S. Cl. 264—41 **4 Claims**

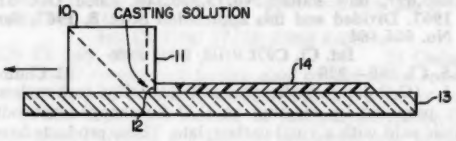
Shaped products are obtained by coagulating aqueous dispersions (latices) of polymers of olefinically unsaturated compounds, for example an emulsion of polyvinyl chloride, by preparing a polyurethane-polyurea in these dispersions.

3,646,179

PROCESS FOR PREPARING HIGH PRESSURE CELLULOSE ACETATE SEMIPERMEABLE MEMBRANES

Regis R. Stana, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 22, 1969, Ser. No. 827,014
Int. Cl. B29d *27/04;* **C08b** *17/36, 21/04*
U.S. Cl. 264—41 **6 Claims**



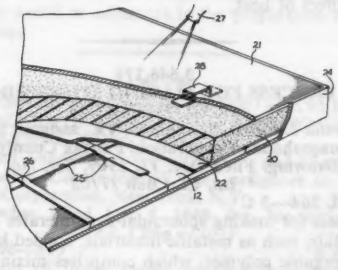
A high strength semipermeable membrane, consisting of a supportive layer and an osmotic skin layer of dense polymeric cellulosic material, is made by (1) mixing polymeric film forming cellulosic material, ethyl acetate and additives such as swelling additives to form a casting solution (2) casting a film from the solution (3) drying the film (4) leaching the film to form a semipermeable membrane and (5) optionally curing the membrane in hot water.

3,646,180

METHOD OF FORMING A FOAM CORED WALL PANEL HAVING CERAMIC TILE ON ONE FACE

Jack M. Winnick, Anaheim, Calif., assignor to Selectile Company, Inc., Los Angeles, Calif.

Filed Oct. 24, 1969, Ser. No. 869,168
Int. Cl. B29d *27/04*
U.S. Cl. 264—45 **6 Claims**



Method of forming a modular wall panel is disclosed herein having a central core composed of a foam plastic

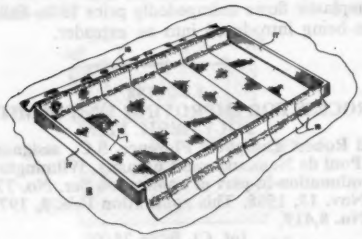
material with a layer of ceramic tiles secured to one surface of the core and a fiber reinforced polyester resin backing layer secured to the other side surface of the core. The abutment joints of the tiles formed by opposing and adjacent edges of the tiles are sealed by strips of adhesive tape and a thin intermediate layer of fiber reinforced polyester resin is disposed between the tape contacting side of the tiles and the core. Securement means for mounting the panel to building structure are incorporated into the fiber reinforced polyester resin backing layer.

3,646,181

METHOD OF CONSTRUCTING AN ORNAMENTAL PLASTER SURFACE UTILIZING A FLEXIBLE WOVEN GLASS STRIP AS AN INTERMEDIATE SUBSTRATE

Alfred O. Galla, P.O. Box 830, Wrangell, Alaska

Filed June 2, 1969, Ser. No. 829,458
Int. Cl. B29c *21/00*
U.S. Cl. 264—73 **1 Claim**



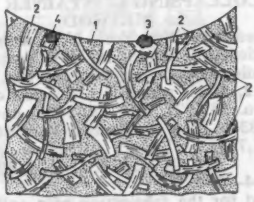
A method of constructing an ornamental plaster surface utilizing flexible strips of woven glass as an intermediate substrate. A mold is covered with flexible woven glass fiber strips and a viscous mixture of Keene's cement and pigment is poured onto the strips. The strips with the mixture adhering thereto are sequentially removed from the mold and applied to a horizontal, vertical or curved surface. The strip is peeled away from the applied viscous mixture and the exterior surface areas are smoothed to remove irregularities.

3,646,182

METHOD FOR PRODUCING A PLASTIC MATERIAL HAVING IMPROVED FRICTIONAL AND SLIDING PROPERTIES

Alois Wilhelm Ferch, Neuss, Germany, assignor to Werner H. Fengler, Dearborn, Mich.

Filed Apr. 3, 1969, Ser. No. 813,135
Int. Cl. B29d *7/18*
U.S. Cl. 264—115 **3 Claims**



An improved plastic anti-friction bearing material is produced by cutting, turning or otherwise subdividing sintered polytetrafluoroethylene plastic material from a solid body thereof, collecting the resilient shavings or chips so produced in a loosely-piled interlock mass thereof with intervening interstices resembling a mass of excelsior, placing this mass in a mold in engagement with the side walls of the mold. A polymerizing liquid mixture suitable for producing a solid polyamide plastic material is then poured into the mold, and thereby filling the interstices between the interlocking shavings or chips of the polytetrafluoroethylene plastic. Although the latter are lighter than the polymerizing liquid mixture, their interlocking engagement with one another and with the side walls of the mold prevent them from floating to the top of the mold, so that the polytetrafluoroethylene chips or shavings become uniformly distributed throughout the interior of the solid polyamide body produced upon polymerization Subsequent removal of the surface layer of this body uncovers the softer polytetrafluoroethylene chips firmly embedded therein.

In subsequent use, as a bearing element, undesired particles of foreign matter such as grit or metal particles merely move a short distance across a polyamide plastic area into the nearest polytetrafluoroethylene plastic area into which they imbed themselves because of the greater softness of the polytetrafluoroethylene plastic, thereby rendering them harmless.

3,646,183

METHOD OF MAKING PELLETS OF PRECIPITATED SILICA

Barry Topcik, Somerville, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,403
Int. Cl. B01j *2/12*
U.S. Cl. 264—117 **7 Claims**

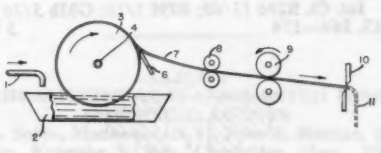
Precipitated silica pigments are pelletized employing from about 0.25 to about 3.0 percent by weight of a surface active agent as a binding agent. The bulk density of the silica is thereby increased, and by means of these pellets the silica can be incorporated into rubber much faster and with greatly reduced fly-loss.

3,646,184

METHOD FOR PRODUCING LESS-STICKY PELLETS OF AMORPHOUS POLYPROPYLENE

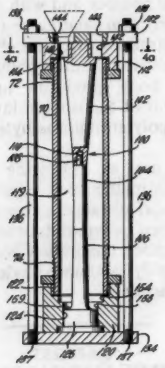
Nobuo Nagao, Yokohamashi, and Toshio Okuda, Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Nov. 10, 1969, Ser. No. 875,166
Int. Cl. B02c *18/00*
U.S. Cl. 264—144 **1 Claim**



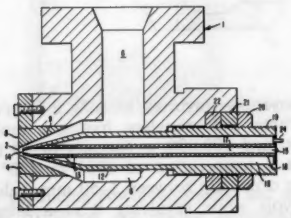
This invention involves forming a reservoir of melted sticky atactic polypropylene having a molecular weight of 10,000 and 100,000, a viscosity of 10 to 1,000 centipoises at a temperature of 130° to 250° C., having a revolving drum dip between 1–50 mm. below the surface of reservoir while revolving it at a linear velocity of 0.005–0.5 m.p.s. so that a layer of polypropylene between 1 mm. and 3 mm. thick adheres to the surface of the drum, cooling the drum, peeling the solidified layer from the rotating drum as a thin sheet, cutting said sheet longitudinally and transversely, and recovering a plurality of pellets of atactic polypropylene that have no mutual stickiness.

3,646,185
METHOD OF CASTING A DIFFUSER ELEMENT
Irving C. Jennings, % The Nash Engineering Co., South Norwalk, Conn.
Continuation-in-part of abandoned application Ser. No. 622,665, Mar. 13, 1967. This application Apr. 16, 1970, Ser. No. 29,251
Int. Cl. B29c 17/12; B28b 7/28
U.S. Cl. 264—161 15 Claims



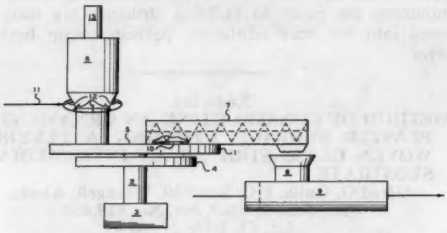
A diffuser element of the type used in a high performance evacuation system as well as the method for fabricating the diffuser is provided. A precisely machined two part tapered mandrel is accurately positioned within a hollow casing. A suitable material that is pourable and which hardens after a period of time is then introduced into the annular chamber defined by the outside diameter of the mandrel and the inside diameter of the casing. After the poured material hardens, the mandrel sections are separated and axially removed. The combination of the hardened material and the casing form the diffuser element.

3,646,186
PROCESS FOR PRODUCING CONTINUOUS ROUND JACKETED LIGHTGUIDES
Thomas C. Hager, Washington, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 600,919, Dec. 12, 1966. This application June 5, 1970, Ser. No. 43,701
Int. Cl. B29d 11/00; B29f 3/10; G02b 5/16
U.S. Cl. 264—174 3 Claims



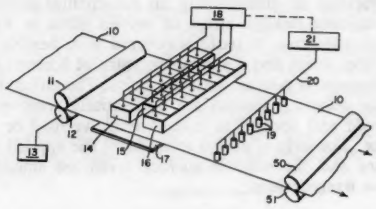
Process and apparatus for protectively jacketing a bundle of polymeric filaments by simultaneously extruding a protective jacket and contacting the bundle with the jacket before the jacket contacts the extrusion orifice.

3,646,187
POLYMER PROCESSING
Paul B. Milam, Jr., and Edward C. Held, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed June 12, 1969, Ser. No. 832,728
Int. Cl. B28b 3/20; B29f 3/08
U.S. Cl. 264—176 8 Claims



A method and apparatus are disclosed for preheating a thermoplastic material to a temperature at which the thermoplastic flows unimpededly prior to its final heating before being introduced into an extruder.

3,646,188
PROCESS FOR IMPROVING UNIFORMITY OF POLYMERIC FILM
David Robert Campbell, Florence, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 775,328, Nov. 13, 1968. This application Feb. 3, 1970, Ser. No. 8,419
Int. Cl. B29c 25/00
U.S. Cl. 264—230 7 Claims

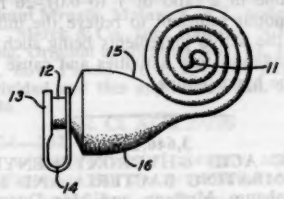


Improving the uniformity of latent shrinkage in an oriented, heat-set polyethylene terephthalate film by heating those portions of the film having higher latent shrinkage to a higher temperature while holding the film between restraint and minimum relaxation. Optical sensing means are used in conjunction with radiant heaters on a continuous length of film.

3,646,189
SELF-COLLAPSING CONTAINER FORMING METHOD
John A. Wiedeman, New York, N.Y., assignor to Polymer Sciences Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 736,515, May 12, 1968, which is a division of application Ser. No. 587,571, Oct. 18, 1966, now Patent No. 3,401,837. This application Feb. 16, 1970, Ser. No. 11,763
Int. Cl. B29c 23/12, 23/20
U.S. Cl. 264—295 9 Claims

A method for the fabrication of a collapsible thermoplastic container for fluid material. A collapsible thermoplastic container is formed from a thermoplastic material having a high tensile modulus. The container includes a chamber defined by a pair of side walls and an end wall, the side and end walls having a retractile memory. The

container is deformed into a helical configuration and then heated to an elevated temperature for a time period



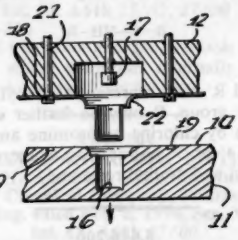
sufficient to heat-set the thermoplastic conainer in a permanent coil configuration.

3,646,190

METHOD FOR STRIPPING FORMED ARTICLES FROM A MOLD

Rudolf A. Spyra, Chicago, Ill., assignor to Seymour C. Graham

Filed Feb. 19, 1969, Ser. No. 800,423
Int. Cl. B29c *7/00*
U.S. Cl. 264—297 9 Claims



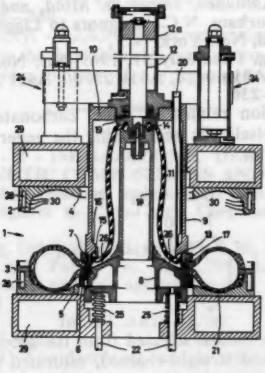
Method for the molding of hollow articles, such as containers, from thermoplastic sheet material, and particularly for the separation, or stripping, of the molded thermoplastic sheet material from the mold after the molding operation is completed.

3,646,191

METHOD FOR INSERTING AN INFLATION BAG INTO A TIRE THAT IS TO BE VULCANIZED

Karl Zängl, 10 Monstrasse, 8000 Munich 13, Germany

Original application July 18, 1966, Ser. No. 565,796, now Patent No. 3,465,385, dated Sept. 9, 1969. Divided and this application Mar. 18, 1969, Ser. No. 833,217
Claims priority, application Germany, Oct. 5, 1965, Z 11,787; Mar. 29, 1966, Z 12,139
Int. Cl. B29h *5/06*
U.S. Cl. 264—315 7 Claims



Method for vulcanizing a tire in a vulcanization press utilizing an inflatable expander. The tire is positioned in the press with the beads disposed axially between bead-engaging form elements and the form elements are moved toward each other to engage the beads. The elements are then moved further toward each other to a position wherein the beads are positioned close to one another and the elasticity of the beads causes them to be seated in the elements. The expander is then inflated and the elements are moved axially away from each other so that the expander is forced between the beads and into the tire. The elasticity of the beads causes them to remain in place in the elements until the expander is forced therebetween to maintain them in place. The tire is then vulcanized.

3,646,192

SILICA GEL STABILIZER FOR SUGAR COATED MULTIVITAMIN TABLETS

Louis Magid, Clifton, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed June 5, 1969, Ser. No. 830,870
Int. Cl. A61k *9/00, 15/00*
U.S. Cl. 424—35 4 Claims

Sugar coated multivitamin tablets prepared by direct compression containing a high potency of vitamin E are stabilized against cracking and oil bleeding by the inclusion of finely divided silica in the sugar coating.

3,646,193

IgA ANTIBODY FROM LACTEAL FLUIDS

Joseph B. Michaelson, 6732 Coldwater Canyon, North Hollywood, Calif. 91606, and John W. Short, 1055 Grover St., Glendale, Calif. 91201

No Drawing. Continuation of application Ser. No. 685,949, Nov. 27, 1967, which is a continuation-in-part of application Ser. No. 451,961, Apr. 29, 1965. This application July 25, 1969, Ser. No. 848,400
Int. Cl. A61k *27/00*
U.S. Cl. 424—85 8 Claims

A new IgA antibody, a lactimmunin, has been discovered. Uniquely, the new product, derived from immune lacteal fluids such as milk whey or colostrum, confers passive immunity without sensitizing effects even when administered parenterally. The product is prepared by selectively cleaving the relatively large lacteal fluid derived antibody molecules into relatively smaller constituents having either allergenic or antibody properties and isolating the nonallergenic, antibody constituent. The cleaving is easily accomplished by proteolytic digestion of the immune lacteal fluid.

3,646,194

MITHRAMYCINS AS TRANSPLANTED TUMOR INHIBITING AGENTS

Ben A. Sobin, Manhasset, N.Y., John B. Routien, Lyme, Conn., Koppaka V. Rao, Cambridge, Mass., William S. Marsh, Wanaque, N.J., and Aline L. Garretson, East Lansing, Mich., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 617,442, Dec. 19,1966, which is a continuation-in-part of application Ser. No. 317,399, Oct. 15, 1963, which in turn is a Continuation-in-part of applications Ser. No. 696,676, Nov. 15, 1957, and Ser. No. 39,572, June 29, 1960. This application Aug. 19, 1968, Ser. No. 753,527
Int. Cl. A61k *21/00*
U.S. Cl. 424—119 7 Claims

The mithramycin A is useful in inhibiting the growth of testicular tumors in man. The mithramycin A, B and C are useful in inhibiting the growth of transplanted tumors in lower animals.

3,646,195

METHOD OF REDUCING ADHESIVENESS AND AGGREGATION OF BLOOD PLATELETS

Axel Fredrik Valdemar Eriksson and Per Olov Svard, Sodertalje, Sweden, and Jorg Jurgens, Frankfurt am Main, Germany, assignors to Aktiebolaget Astra, Sodertalje, Sweden

No Drawing. Original application Aug. 26, 1966, Ser. No. 575,406, now Patent No. 3,509,024. Divided and this application Jan. 20, 1970, Ser. No. 4,421

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 **4 Claims**

An aspergillopeptidase ARL 1 isolated from a mixture of aspergillopeptidases has been found effective in reducing adhesiveness and aggregation of blood platelets and is useful in the prevention of the formation of thrombi and emboli.

3,646,196

PROCESS FOR CONTROLLING PULP CHIP DETERIORATION WITH KRAFT GREEN LIQUOR

Edward L. Springer and Wallace E. Eslyn, Madison, Wis., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 29, 1970, Ser. No. 33,074

Int. Cl. A01n *11/00, 11/06*

U.S. Cl. 424—162 **1 Claim**

This invention relates to a treatment used to control the deterioration of pulp chips during outdoor stock piling for long periods of time. The treatment involves a spraying or dipping of the pulp chips with a kraft green liquor which is a mixture of sodium sulfide and sodium carbonate in water. The treatment greatly reduces the loss of wood substance over long periods of outdoor storage. The loss of wood substance in wood chips with the treatment is approximately one-third or less than that without the treatment.

3,646,197

NOVEL PROCESS FOR REMOVING COPPER FROM COPPER-CONTAINING BLEOMYCIN

Hamao Umezawa and Yasuhiko Muraoka, Tokyo, and Yuya Nakayama, Yono-shi, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

No Drawing. Filed May 14, 1969, Ser. No. 824,666

Claims priority, application Japan, May 21, 1969, 44/33,742

Int. Cl. A61k *21/00*

U.S. Cl. 424—177 **6 Claims**

A process for removing copper from a solution of copper-containing bleomycin produced from a culture broth of *Streptomyces verticillus,* in which the copper can be completely removed in a short period of time by adding to said solution hydrogen sulfide or a water-soluble sulfide, e.g. an alkali metal sulfide or an alkali metal thiosulfate thereby removing the copper as a copper sulfide, or by adding a boron hydride compound or a hydrosulfite salt thereby removing the copper as cuprous oxide. According to this process, an improved bleomycin having no ill effects on human body can be obtained.

3,646,198

ORAL SYNERGIZED ANTI-INFLAMMATORY COMPOSITIONS

Frank Eberhard Zimmerman, Mannheim, Germany, assignor to A. G. Knoll Chemische Fabriken, Ludwigshaven (Rhine), Germany

No Drawing. Filed Dec. 30, 1969, Ser. No. 889,329

Claims priority, application Germany, Jan. 2, 1969, P 19 00 041.0

Int. Cl. A61k *27/00*

U.S. Cl. 424—180 **11 Claims**

A pharmaceutical composition for oral administration having anti-inflammatory, anti-pyretic and analgesic properties comprising as the active ingredients escin and 1-phenyl - 2,3-dimethyl-4-(2-bicyclo[2.2.1]heptyl)-amino-3-pyrazoline-5-one in a ratio of 1 to 0.01–20 respectively and in an amount sufficient to relieve the inflammation, the ratio of the active ingredients being such as to synergize their inflammatory activities and cause their acute toxicities to be hypoadditive.

3,646,199

SALICYCLIC ACID o-HYDROXYPHENYLAMIDES FOR COMBATING BACTERIA AND FUNGI

Max Schellenbaum, Muttenz, and Max Duennenberger, Frenkendorf, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 745,100, July 6, 1968. This application Sept. 23, 1970, Ser. No. 74,839

Claims priority, application Switzerland, July 26, 1967, 10,607/67

Int. Cl. A01n *9/24*

U.S. Cl. 424—230 **6 Claims**

This invention provides a method of use for combating harmful microorganisms, such as fungi and bacteria, by applying a salicylic o-hydroxyphenylamide of the general formula

wherein R and R′ each represent a phenyl group with an ortho hydroxy group. R may be further substituted in 3 and 5 position by chlorine or bromine and R′ is further substituted in 4′ or 5′ position by trifluoromethyl, alkyl, cycloalkyl, aryl and aralkyl residues.

3,646,200

TREATMENT OF INFLAMMATION WITH SALICYLIC ACIDS

Tsung-Ying Shen, Bruce E. Witzel, and Gordon L. Walford, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 25, 1969, Ser. No. 836,640

Int. Cl. A61k *27/00*

U.S. Cl. 424—230 **4 Claims**

New substituted phenoxysalicylic acids and non-toxic pharmaceutically acceptable salts, esters, and amides derived therefrom. The substituted phenoxysalicylic acids disclosed herein have anti-inflammatory, anti-pyretic, and analgesic activity. Also included are methods for preparing said phenoxysalicylic acid compounds.

3,646,201

SALICYLATE CARBONATE COMPOUNDS

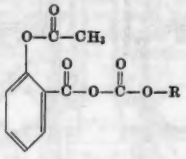
Andrew G. Kallianos, James D. Mold, and Melvyn I. Simpson, Durham, N.C., assignors to Liggett & Myers Incorporated, New York, N.Y.

No Drawing. Filed July 31, 1969, Ser. No. 846,596

Int. Cl. A01n *9/24;* **A61k** *27/00;* **A61l** *13/00*

U.S. Cl. 424—230 **8 Claims**

This invention relates to novel carbonate anhydride esters of acetylsalicylic acid having the general formula:



wherein R is a radical selected from the group consisting of branched and straight-chained, saturated and unsaturated, aliphatic and alicyclic alcohols having from 2 to 30 carbon atoms and polyhydroxy compounds and mixtures thereof.

3,646,202
LIVER FLUKE COMPOSITIONS CONTAINING SALICYLIC ACID DERIVATIVES
Helmut Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Original application Nov. 22, 1967, Ser. No. 684,968, now Patent No. 3,539,639, dated Nov. 10, 1970. Divided and this application Jan. 16, 1970, Ser. No. 8,146
Int. Cl. A61k *27/00*
U.S. Cl. 424—232 4 Claims
Salicylic acid derivatives of phenoxy- and phenylthiopyridines. Processes for the preparation of substituted salicylic acid derivatives of phenoxy- and phenylthiopyridines. Anthelmintic compositions useful in the treatment of parasitic diseases containing a substituted salicylic acid derivative of a phenoxy- or phenylthiopyridine as an active ingredient.

3,646,203
METHOD OF TREATING MILK FEVER IN DAIRY CATTLE WITH 25-HYDROXYCHOLECALCIFEROL
Hector F. De Luca, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.
No Drawing. Filed Apr. 30, 1969, Ser. No. 820,673
Int. Cl. A61k *15/02, 27/00*
U.S. Cl. 424—236 4 Claims
A method of treatment and prophylaxsis for milk fever in dairy cattle which comprises internally administering to the cattle 25-hydroxy-cholecalciferol.

3,646,204
TRIAZINE ANORECTIC METHOD
Abdulmuniem H. Abdallah, Zionsville, Ind., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Feb. 6, 1970, Ser. No. 9,398
Int. Cl. A61k *27/00*
U.S. Cl. 424—249 5 Claims
This invention relates to a method useful for suppression of appetite and reduction of food intake in animals by means of administering to animals an anorectic amount of 3 - (3,4-dichlorophenoxymethyl)-1,4,5,6-tetrahydro-astriazine or a pharmacologically-acceptable salt thereof.

3,646,205
DERIVATIVES OF 9-PYRIDYLALKYL-1,2,8,9-TETRAAZAPHENALENES FOR LOWERING BLOOD PRESSURE
John E. Francis, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Original application Aug. 12, 1968, Ser. No. 751,734, now Patent No. 3,542,777, dated Nov. 24, 1970. Divided and this application Jan. 6, 1970, Ser. No. 661
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 14 Claims
9-pyridylalkyl - 1,2,8,9 - tetraazaphenalenes, optionally substituted in the 3-position by hydroxy or mercapto and in the 7-position by phenyl, are hypotensive agents.

3,646,206
PYRIDYL - 2 - IMIDAZOLONIC DERIVATIVES IN THERAPEUTIC COMPOSITIONS AND METHODS
Karl J. Doebel, Ossining, and Norbert Gruenfeld, Bronx, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Original application Dec. 30, 1968, Ser. No. 788,007, now Patent No. 3,542,798, dated Nov. 24, 1970. Divided and this application Jan. 19, 1970, Ser. No. 8,141
Int. Cl. A61k *27/00*
U.S. Cl. 424—263 12 Claims
1-(pyridyl)-2-imidazolones which may be substituted in 4- and/or 5-position are analgesic, anti-inflammatory, and antipyretic agents. An illustrative embodiment is 1-(3-pyridyl)-4,5-dimethyl-2-imidazolone.

3,646,207
PHARMACEUTICAL COMPOSITIONS
Willem Soudyn, Turnhout, and Ineke van Wijngaarden, Beerse, Belgium, assignors to Janssen Pharmaceutica, N.V.
No Drawing. Filed Nov. 4, 1968, Ser. No. 773,324
Int. Cl. A61k *27/00*
U.S. Cl. 424—266 11 Claims
Pharmaceutical compositions of a 4-phenylisonipecotic acid derivative having analgesic and anti-diarrheal activity.

3,646,208
INHIBITION OF HISTIDINE DECARBOXYLASE
Edward Ervin Smissman, Lawrence, Kans., and James Allen Weis, Albany, Calif., assignors to Kansas University Endowment Association, Lawrence, Kans.
No Drawing. Filed Oct. 17, 1969, Ser. No. 867,396
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 9 Claims
α-Amino-β-imidazolyl-ethyl alkyl ketones as inhibitors of histidine decarboxylase.

3,646,209
PHARMACEUTICAL METHODS AND COMPOSITIONS UTILIZING 2-ALKANOYL OR AROYL-3-AMINOALKOXYINDOLES
Arne Elof Brandstrom, Goteborg, and Stig Ake Ingemar Carlsson, Molnlycke, Sweden, and Andre Gagneux, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Original application Jan. 22, 1968, Ser. No. 699,289, now Patent No. 3,509,163, dated Apr. 28, 1970. Divided and this application Sept. 26, 1969, Ser. No. 870,727
Int. Cl. A61k *27/00*
U.S. Cl. 424—274 22 Claims
The compounds are of the class of indole derivatives, more particularly indole derivatives substituted in 2- and 3-positions and acid addition salts thereof. The compounds are useful as analgesic, anti-inflammatory, antitussive, tranquilizing, anti-allergic and anaestesia-potentiating agents. An illustrative embodiment is 2-benzoyl-3-(2-pyrrolidinoethoxy)indole.

3,646,210
FUNGICIDAL AND BACTERICIDAL COMPOSITION AND METHOD CONTAINING 3-THIOCYANOINDOLE DERIVATIVES
Stig Hjalmar Johannes Akerstrom, Konvaljegrand 3A, 75251 Uppsala, Sweden; Albert Tempel, Van Houtenlaan, Netherlands; and Bengt Hjalmar Gullfeldt, Selangergrand 3, 16229 Vallingby, Sweden
No Drawing. Original application Jan. 3, 1968, Ser. No. 695,352, now Patent No. 3,546,244, dated Dec. 8, 1970. Divided and this application June 8, 1970, Ser. No. 44,602
Claims priority, application Sweden Jan. 4, 1967, 193/67; June 2, 1967, 7,722/67
Int. Cl. A01n *9/22*
U.S. Cl. 424—274 4 Claims
3-thiocyanoindoles found to be useful fungicides and bactericides.

3,646,211
GLYCIDAMIDES FOR INDUCING A TRANQUILIZER RESPONSE
Carolyn M. Quick, Manteca, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Jan. 22, 1970, Ser. No. 5,109
Int. Cl. A61k *27/00*
U.S. Cl. 424—278 4 Claims
2-phenylglycidamides such as 3-chloro-2-(2,4-dichlorophenyl) glycidamide, are described. The compounds have

utility in the polymer field and also possess useful biological activity.

3,646,212

MITICIDES COMPRISING AN ESTER OF 4,6-DINITRO-2-SEC. BUTYL-PHENOL AND 2,4,5,4'-TETRACHLORODIPHENYL SULFIDE OR SULFONE

Ludwig Friedrich Emmel, Bergen-Enkheim, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 29, 1969, Ser. No. 845,912
Claims priority, application Germany, Aug. 14, 1968, P 17 92 281.5
Int. Cl. A01n *9/12, 9/14, 9/20*
U.S. Cl. 424—301 3 Claims

Pesticidal compositions comprising 4,6-dinitro-2-sec. butylphenyl dimethyl acrylate (binapacryl), 4,6-dinitro-2-sec. butylphenyl stearate or 4,6-dinitro-2-sec. butylphenyl isopropyl carbonate (dinobuton) in combination with 2,4,5,4'-tetrachlorodiphenyl sulfide (tetrasul) or 2,4,5,4'-tetrachlorodiphenyl sulfone (tetradifon). The combinations have a synergistic effect and are especially useful in the control of spider mites.

3,646,213

COMPOSITIONS AND METHODS FOR TREATING DEPRESSION WITH COMBINATIONS OF L-3,4-DIHYDROXYPHENYLALANINE AND A HYDRAZINE

Giuseppe Bartholini, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation of application Ser. No. 753,074, Aug. 16, 1968, now Patent No. 3,557,292. This application Aug. 12, 1970, Ser. No. 63,332
Int. Cl. A61k *27/00*
U.S. Cl. 424—319 4 Claims

Pharmaceutical compositions are described which contain, as the active ingredients (1) L-3,4-dihydroxyphenylalanine and (2) an N'-substituted-N^2-(2,3,4-trihydroxybenzyl)-hydrazine selected from the group consisting of N' - dl - seryl - N^2 - (2,3,4 - trihydroxybenzyl)-hydrazine, N' - l - seryl - N^2 - (2,3,4-trihydroxybenzyl) - hydrazine, N' - glycyl - N^2 - (2,3,4-trihydroxybenzyl)-hydrazine and N' - tyrosyl - N^2-(2,3,4-trihydroxybenzyl)-hydrazine.

3,646,214

METHOD OF PROTECTING EYE MAKEUP

Solomon Katz, 84—24 253rd St., Bellrose, N.Y., and Renee Laglenne, 218 N. Long Beach Road, Rockville Centre, N.Y. 11570

No Drawing. Filed Aug. 20, 1968, Ser. No. 753,885
Int. Cl. A61k *7/02*
U.S. Cl. 424—362 3 Claims

A cosmetic formulation which prevents smudging and running of eye makeup and which acts as a sealer for the eye makeup comprises a minor amount of a film-forming material in a major amount of solvent.

3,646,215

HEPTADECANOL FOR MEDICAL PURPOSES

Walt Phillips, Newark, N.J., assignor to Commodity Improvements, Inc.

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,392
Int. Cl. A61k *27/00*
U.S. Cl. 424—343 9 Claims

Heptadecanol has been found useful for medical purposes to reduce pain and promote rapid healing. The heptadecanol may be applied to the affected parts of the human or animal body by any conventional means, in its pure form or in a solvent.

ERRATA

For Classes 260—573 thru 260—680 see:
Patent Nos. 3,646,216 thru 3,646,239

3,646,216

N^1-AMINOALKYL DERIVATIVES OF 2-NITRO-p-PHENYLENEDIAMINE

Jerome Marshall Cinnamon and Morton A. Westman, North Caldwell, N.J., assignors to Shulton, Inc., Clifton, N.J.

No Drawing. Filed Sept. 1, 1967, Ser. No. 664,937
Int. Cl. C07c *87/62*
U.S. Cl. 260—573 7 Claims

This invention relates to novel compounds capable of producing striking colors in keratinacious material, especially live human hair. These compounds, which are N^1-aminoalkyl derivatives of 2-nitro-p-phenylenediamine containing an hydroxyalkyl group in the N^4 position, are highly useful in preparing high fashion colors for hair dyeing. Certain of the compounds of this invention are especially useful for effecting a bluish-purple color. This type of compound has significant value in the dyeing of gray hair which has a yellow tint. The compounds of this invention cover a wide spectrum of colors and are used either alone, in combination or combined with other dyes for producing various shades of blond to dark brown or black.

3,646,217

ALKANONE MANUFACTURE

Richard D. Smetana, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Mar. 26, 1968, Ser. No. 716,234
Int. Cl. C07c *49/02*
U.S. Cl. 260—593 R 5 Claims

A method of preparing an alkanone comprising contacting a secondary alkyl halide with alkali metal fluoride in the presence of dimethyl sulfoxide at a temperature less than 140° C., preferably under anhydrous conditions and in the presence of an oxygen containing gas.

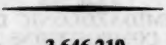
3,646,218

PENICILLIC ACID DERIVATIVES AND RELATED COMPOUNDS AND METHOD OF PRODUCING THEM

Jerold Alan Last, Princeton, and Saul Lewis Neidleman, Lawrence Township, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed May 14, 1969, Ser. No. 824,693
Int. Cl. C07c *49/24*
U.S. Cl. 260—594 7 Claims

This invention relates to brominated products of the general formula



and to the method of producing them. The products are useful as antimicrobial agents and also as intermediates.

3,646,219

ALKYLTHIOMETHYL PHOSPHONIUM DERIVATIVES

Donald J. Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Original application Mar. 13, 1967, Ser. No. 622,419, now Patent No. 3,502,731, dated Mar. 24, 1970. Divided and this application Jan. 19, 1970, Ser. No. 4,042
Int. Cl. C07f *9/54*; D06m *13/28*
U.S. Cl. 260—606.5 F 6 Claims

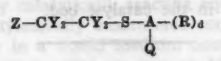
This invention is directed to organothiomethyl phosphonium halides which compounds find utility as textile softeners.

3,646,220
HYDROXYETHYLTHIO PHENOLS AND PROCESS FOR PREPARING SAME

Norman W. Dachs, Buffalo, and Robert Gruber, Tonawanda Township, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Aug. 5, 1968, Ser. No. 749,953
Int. Cl. C07c *149/36*
U.S. Cl. 260—609 F 17 Claims

Hydroxyarylthio compounds of the formula

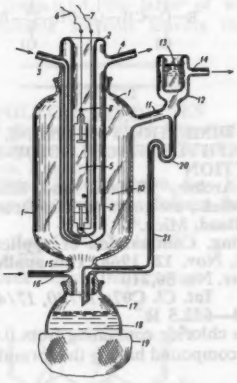


wherein *d* is from 0 to about 6; Z is selected from the group-consisting of mercapto, hydroxy, alkylthio of 1 to about 10 carbon atoms, alkoxy of 1 to about 10 carbon atoms, alkylthio of 1 to about 10 carbon atoms and alkylcarbonyloxy of 2 to about 10 carbon atoms; Y is selected from the group consisting of hydrogen and alkyl of 1 to about 5 carbon atoms; A is aryl of 6–18 carbon atoms; R is selected from the group consisting of alkyl, aralkyl, alkaryl, aryl, carbaryloxy, alkoxy, aryloxy, alkylthio, arylthio, hydroxy, mercapto, cyano, carboxy and halogen and is of 0 to about 10 carbon atoms and Q is selected from the group consisting of —OH and —O(CO)NHR², wherein R² is alkyl of one to about 10 carbon atoms, provided that when Q is —O(CO)NHR², Z may also be halogen. A typical compound is hydroxyethylthiophenol. A process for the preparation of said compounds and their pesticidal utility are also described.

3,646,221
BIS(TRIFLUOROMETHYLTHIO) FLUOROBUTANES

Robert E. A. Dear and Everett E. Gilbert, Morris Township, Morris County, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,428
Int. Cl. C07c *149/16*
U.S. Cl. 260—609 A 4 Claims



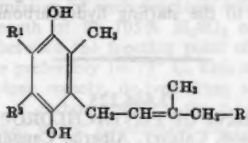
Bis(trifluoromethylthio) fluorobutanes useful as thermally stable dielectric coolants or insecticidal fumigants, and process for preparing them by subjecting a vaporous mixture of bis(trifluoromethyl)disulfide and certain fluoroethylenes to ultraviolet light in the wave length range between about 2000 A. and about 3600 A. at temperatures of at least about 35° C.

3,646,222
METHOD FOR PRODUCTION OF SUBSTITUTED HYDROQUINONES

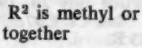
Yutaka Kawamatsu, Suita, Osaka, Marekichi Sasaki, Yokohama, and Hiroshi Morimoto, Nishinomiya, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed May 15, 1969, Ser. No. 825,031
Claims priority, application Japan, May 20, 1968, 43/33,898
Int. Cl. C07c *37/00, 41/00*
U.S. Cl. 260—613 D 7 Claims

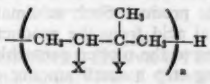
A method for producing tetra-substituted hydroquinones of the formula



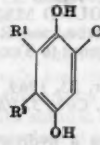
wherein each of R^1 and R^2 is methyl or methoxy, or R^1 and R^2 represent, taken together



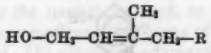
and R represents a univalent radical of the formula:



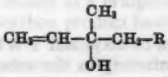
wherein X and Y are each a hydrogen atom or, taken together, represent a double bond between the carbon atoms to which they attach, and *n* is an integer from 0 to 9, is provided. A tri-substituted hydroquinone of the formula



is condensed with a β-unsaturated alcohol of the formula



or



in the presence of an N-sulfinyl compound.

3,646,223
1,4-DIMETHYLOL-1,4-DIALKYL CYCLOHEXANE AND SYNTHESIS

Ralph C. Schreyer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 18, 1968, Ser. No. 722,204
Int. Cl. C07c *35/02*; C07g *17/08, 22/00*
U.S. Cl. 260—617 R 3 Claims

1,4-dialkyl-1,4-disubstituted cyclohexanes where the substituent is $—CO_2X$, $—CONX_2$, $—COCl_2$, $—CH_2NH_2$, —CN or CH_2OH, X being hydrogen or alkyl of 1–6 carbon atoms, which cyclohexanes are useful as polymer intermediates.

3,646,224
CONVERSION OF ADAMANTANE HYDROCARBONS TO MONOOLS
Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Dec. 17, 1968, Ser. No. 784,487
Int. Cl. C07c *35/44*
U.S. Cl. 260—617 F 14 Claims

Adamantane hydrocarbons of the C_{10}–C_{30} range having at least one unsubstituted bridgehead position are admixed with fuming sulfuric acid (102–112% H_2SO_4 equivalent) at a temperature between the freezing point of the acid and 50° C. to effect dissolution and the mixture is then reacted with water to form bridgehead monools corresponding to the starting hydrocarbons.

3,646,225
TREATMENT OF PENTACHLOROPHENOL
Jack A. Morrison, Calgary, Alberta, Canada, assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed July 24, 1967, Ser. No. 657,465
Int. Cl. C07c *39/24*
U.S. Cl. 260—623 R 3 Claims

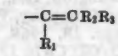
Granular pentachlorophenol such as that used for preserving wood slowly sublimes during storage to form a finely crystalline dust which is highly irritating to skin and mucous membranes and which adversely affects the appearance of the product. Such sublimation and vaporization of residual acid from the product are essentially avoided by adding to the molten pentachlorophenol prior to the granulating step a small amount of an amine of low volatility. Alkanolamines such as diethanolamine and triethanolamine are particularly suitable for the purpose.

3,646,226
HYDROXY COMPOUND MANUFACTURE
Richard D. Smetana, Beacon, and Roger G. Duranleau, Poughquag, N.Y., assignors to Texaco Inc., New York, N.Y.
No Drawing. Filed Apr. 23, 1969, Ser. No. 818,841
Int. Cl. C07c *37/00*
U.S. Cl. 260—621 G 4 Claims

A method of preparing a hydroxy compound of the formula:

where R is hydrogen or alkyl and Y is hydrogen or —OH comprising first contacting in the substantial absence of water an alpha-olefinic compound of the formula:

where X is



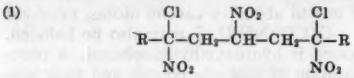
Z is hydrogen or X, R_1, R_2 and R_3 are hydrogen or alkyl, R is as heretofore defined with ozone and alkanoic acid and then contacting the resultant reaction mixture with mineral acid and water.

3,646,227
HYDROGENATION OF ALDEHYDE IMPURITIES
Reuben H. Grinstein, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,169
Int. Cl. C07c *29/24*
U.S. Cl. 260—643 B 6 Claims

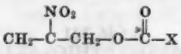
The effective life of solid nickel hydrogenation catalysts used in hydrogenation of aldehyde and acetal impurities in aliphatic alcohols prepared by the carbonylation and hydrogenation of olefin is improved by the use of a solid basic substance in the catalyst bed.

3,646,228
POLYCHLORO-POLYNITRO-ALKANES AND THEIR MANUFACTURE
Milton B. Frankel, Menlo Park, Marvin H. Gold, Sacramento, and Henry J. Marcus, West Covina, Calif., assignors to Aerojet-General Corporation, Azusa, Calif.
No Drawing. Original application July 30, 1964, Ser. No. 386,379, now Patent No. 3,440,282, dated Apr. 22, 1969. Divided and this application Aug. 19, 1968, Ser. No. 798,204
Int. Cl. C07c *79/12*
U.S. Cl. 260—644 8 Claims

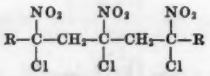
A method of preparing a compound of the formula:

(1) 

which comprises reacting an allyl alcohol ester of the formula

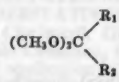
(2) 

with a 1-chloro-1-nitroalkane, wherein the foregoing formulae, R is lower alkyl and X is a monovalent organic radical, and recovering the product thus obtained; and the method of reacting chlorine with the compound of Formula 1 to produce



3,646,229
USE OF DIMETHOXYMETHANE TO INHIBIT A METHYLENE CHLORIDE-ALUMINUM REACTION
Wesley L. Archer, Midland, and Elbert L. Simpson, Auburn, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation of application Ser. No. 775,182, Nov. 12, 1968. This application July 13, 1970, Ser. No. 56,210
Int. Cl. C07c *17/40, 17/42*
U.S. Cl. 260—652.5 R 5 Claims

Methylene chloride containing from 0.03 to 10.0 weight percent of a compound having the formula:



wherein R_1 may be hydrogen and R_2 may be hydrogen or a methyl radical, and wherein R_1 and R_2 may be taken together and represent oxygen. The composition is stable in combination with an aromatic hydrocarbon such as toluene, xylene or naphthalenes, when used in combination with aluminum to prepare paints and lacquers.

3,646,230

HYDROFLUORINATION OF ACETYLENIC UNSATURATES TO PRODUCE OLEFIN FLUORIDES

Frederick E. Kung, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation of application Ser. No. 591,078, Nov. 1, 1966. This application Feb. 26, 1969, Ser. No. 802,646

Int. Cl. C07c *17/08, 21/18, 25/14*

U.S. Cl. 260—653.4 7 Claims

Olefinically unsaturated fluorides, such as vinyl fluoride, are prepared by catalytically reacting equimolar proportions of an acetylenically unsaturated compound and hydrogen fluoride in a liquid medium containing an inert fluoride salt as an essential component. Mercury catalysts are used.

3,646,231

DIORGANOMAGNESIUM REAGENTS AND METHODS OF PREPARING SAME

Conrad W. Kamienski, Gastonia, N.C., and Jerome F. Eastham, Knoxville, Tenn., assignors to Lithium Corporation of America, Bessemer City, N.C.

No Drawing. Original application May 13, 1968, Ser. No. 728,838. Divided and this application Mar. 5, 1970, Ser. No. 16,958

Int. Cl. C07f *1/00, 1/02*

U.S. Cl. 260—665 R 2 Claims

Diorganomagnesium reagents are prepared by processes which separate halides as insoluble salts from magnesium reagents. The processes are convenient and practical and provide diorganomagnesium compounds and derivatives as solids or in solution with or without solvation; the processes have provided new diorganomagnesium compounds and derivatives and solutions of diorganomagnesium compounds never previously obtained. One principal process by which the separation is accomplished is precipitation of the salt lithium halide from reaction of an organolithium reagent with an organomagnesium halide or with a magnesium halide. A second process developed for separation of halide from a magnesium reagent involves formation of the salt magnesium halide from an organomagnesium halide in a medium that will not dissolve the salt. A third process involves reaction of magnesium directly with an organic halide under conditions that produce a mixture of magnesium halide and diorganomagnesium compound, the latter of which can be dissolved into suitable solvents leaving the halide as insoluble salt.

3,646,232

POLYCYCLIC DIENES

Richard Gregory Foster and Paul Hepworth, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

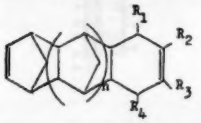
No Drawing. Filed July 20, 1970, Ser. No. 56,665

Claims priority, application Great Britain, July 22, 1969, 36,827/69

Int. Cl. C07c *13/28*

U.S. Cl. 260—666 PY 11 Claims

A polycyclic diene having the structure



where n is a whole number of at least one and each of R_1, R_2, R_3 and R_4 is either a hydrogen atom or a monovalent hydrocarbyl group, preferably an alkyl group, or derivatives thereof in which one or more of the carbon atoms in or forming part of the endomethylene bridged rings and not forming part of a carbon-carbon double bond carries a monovalent hydrocarbyl substituent group and a process for the preparation of the polycyclic diene by Diels-Alder reaction.

3,646,233

REACTION OF PARAFFINS WITH ADAMANTANE COMPOUNDS

Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 877,004, Nov. 14, 1969. This application Oct. 14, 1970, Ser. No. 80,779

Int. Cl. C07c *3/54*

U.S. Cl. 260—666 M 19 Claims

Saturated adamantane hydrocarbons of the C_{10}–C_{19} range having 0–3 alkyl substituents and/or their corresponding adamantanols are reacted with C_3–C_{20} n-paraffins and/or with certain types of C_4–C_{20} isoparaffins by contacting a mixture of such reactants with sulfuric acid having a strength of 96–105% H_2SO_4 equivalent at a temperature between the freezing point of the acid and 100° C., more preferably 10–75° C. This causes a C_3–C_{20} alkyl or alkylene moiety, derived from and having the same number of carbon atoms as the n-paraffin used, to become attached to the adamantane nucleus. As a result two types of products are obtained: (1) alkylated adamantane hydrocarbon having one adamantane nucleus per molecule with the C_3–C_{20} alkyl moiety as a bridgehead substituent; and (2) bis-type hydrocarbon product having two adamantane nuclei linked between bridgehead positions through the C_3–C_{20} alkylene moiety. Both types of products are particularly suitable as components of traction fluids.

3,646,234

REACTION OF NAPHTHENE HYDROCARBONS WITH ADAMANTANE COMPOUNDS

Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 80,779, Oct. 14, 1970, which is a continuation-in-part of application Ser. No. 877,004, Nov. 14, 1969. This application Nov. 19, 1970, Ser. No. 91,183

Int. Cl. C07c *3/54, 13/28*

U.S. Cl. 260—666 M 14 Claims

Saturated adamantane hydrocarbons of the C_{10}–C_{19} range having 0–3 alkyl substituents and/or their corresponding adamantanols are reacted with C_5–C_{20} mono cyclic naphthene hydrocarbons by contacting a mixture of such reactants with sulfuric acid having a strength of 96–105% H_2SO_4 equivalent at a temperature between the freezing point of the acid and 100° C., more preferably 10–75° C. This causes a C_5–C_{20} cycloalkyl or cycloalkylene moiety, derived from and having the same number of carbon atoms as the naphthene used, to become attached to the adamantane nucleus. Two types of alkylation products are obtained: (1) alkylated adamantane hydrocarbon having one adamantane nucleus per molecule with the C_5–C_{20} cycloalkyl moiety as a bridgehead substituent; and (2) bis-type hydrocarbon product having two adamantane nuclei linked between bridgehead positions through the C_5–C_{20} cycloalkylene moiety. When the starting naphthene has a C_5 ring, a naphthene dimerization product having perhydronaphthalene structure is also obtained. All types of products are particularly suitable as components of traction fluids.

3,646,235

CATALYTIC HYDROGENATION OF ALPHA METHYL STYRENE

Edwin D. Little, Convent Station, and Zafarullah K. Cheema, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,070

Int. Cl. C07c *5/16*

U.S. Cl. 260—667 4 Claims

Alpha ethyl styrene, obtained as a by-product in the manufacture of phenol is hydrogenated back to cumene using hydrogen and standard hydrogenation catalysts which are selective for the ethylenic side chain. Prior to

hydrogenation the alpha methyl styrene is treated to effect removal of hydroxy acetone present. By reducing or eliminating hydroxy acetone, poisoning of the catalyst is prevented. Hydroxy acetone is removed from the alpha methyl styrene by water washing, distillation, or by chemical methods as for example by treating with an amine.

3,646,236

DISPROPORTIONATION OF TOLUENE WITH A PLATINUM-RHENIUM-SOLID OXIDE CATALYST

Carl D. Keith, Summit, Milton H. Dalson, Mendham, and William C. Pfefferle, Middletown, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,441

Int. Cl. C07c *3/62*

U.S. Cl. 260—672 T **15 Claims**

There is disclosed a method for disproportionating toluene to benzene and xylene. The process is conducted in the presence of hydrogen and a catalyst containing a platinum group metal and rhenium on a porous, solid, acidic support. Lower alkylbenzenes of 9 to 10 carbon atoms may also be fed to the reaction zone.

3,646,237

PROCESS FOR RECOVERING ISOBUTYLENE

Tatsuo Horie and Shigeyuki Hayashi, Tokyo, Japan, assignors to Nippon Oil Company, Limited, Minato-ku, Tokyo, Japan

No Drawing. Filed Aug. 28, 1969, Ser. No. 853,935

Claims priority, application Japan, Sept. 7, 1968, 43/64,170

Int. Cl. C07c *11/02*

U.S. Cl. 260—677 A **6 Claims**

A process for recovering highly purified isobutylene comprising contacting an isobutylene-containing hydrocarbon mixture with an aqueous solution which is acidified with hydrochloric acid and containing a chloride of a metal selected from the group consisting of zinc, tin, antimony and bismuth to allow the isobutylene to be absorbed in the form of tert-butyl alcohol in the aqueous solution; removing unreacted hydrocarbons from said solution; subjecting the solution to degassing treatment; and subjecting them to dehydrating treatment; in which the present invention is characterized in said degassing treatment.

3,646,238

TREATING DETERGENT ALKYLATE

Harry E. Jacobs, Glenwood, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed July 13, 1970, Ser. No. 54,564

Int. Cl. C07c *7/00, 3/50*

U.S. Cl. 260—674 A **10 Claims**

Method for treating raw detergent alkylate in order to improve the color and odor characteristics of the alkyl benzene sulfonates produced from the alkylate by contacting the raw alkylate with activated charcoal and thereafter selectively hydrogenating the contacted alkylate to avoid hydrogenating the alkyl benzene compounds, said hydrogenation being carried out by contacting said contacted detergent alkylate with a hydrogen containing gas in the presence of a catalyst at a temperature in the range of from about 50° F. to about 200° F. and at a pressure in the range of from about 5 p.s.i.g. to about 50 p.s.i.g.

3,646,239

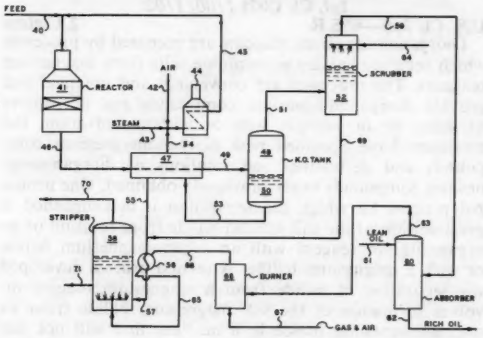
ENZYMATIC TREATMENT OF HYDROCARBON DEHYDROGENATION EFFLUENT

Thomas Hutson, Jr., and Ronald E. Riter, Bartlesville, Okla., assignors to Phillips Petroleum Company

Continuation-in-part of abandoned application Ser. No. 751,833, Aug. 12, 1968. This application June 3, 1969, Ser. No. 830,083

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **4 Claims**



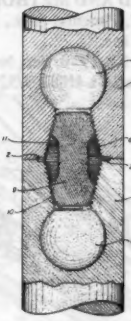
Excess purge water containing oxygenated hydrocarbons resulting from hydrocarbon dehydrogenation processes is rendered nontoxic by the conversion of the oxygenated hydrocarbons to water and carbon oxides in the presence of microorganisms, e.g., saprophytic bacteria, protozoa, yeast and fungi, under aerobic conditions. In preferred embodiments of the invention, the purge water prior to treatment with microorganisms is reboiled or stripped with a hot gas to reduce the concentration of oxygenated hydrocarbons.

ELECTRICAL

3,646,240
ELECTRODE JOINT

John G. Lewis, Ann Arbor, Mich., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Filed Aug. 28, 1970, Ser. No. 67,818
Int. Cl. H05b 7/06
U.S. Cl. 13—18 7 Claims



A furnace electrode assembly of the type including a pair of electrode sections having tapered threaded sockets and a nipple threaded into each of the sockets to hold the sections in face-to-face contact is characterized by a pair of counterbores at the bottom of the sockets and a portion at the center of the nipple which is devoid of threads.

3,646,241
STOP ACTUATION DEVICE IN ORGANS

Dieter Ott, Heinrich-Sohnrey-Strasse 12a, 34 Gottingen, Germany

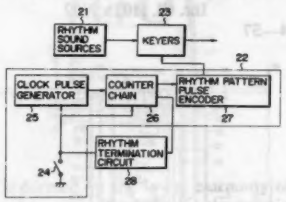
Filed Mar. 4, 1970, Ser. No. 16,348
Claims priority, application Germany, Mar. 5, 1969, G 69 08 662
Int. Cl. G10f 1/00
U.S. Cl. 84—1.03 1 Claim

The innovation pertains to a stop actuation device in organs with a keyboard, stop draws and electrical and/or electropneumatical operation of the stop control assembly from the keyboard assembly, which incorporates a preselection device for different stop combinations that can be activated over control mechanisms at the keyboard touch assembly.

3,646,242
AUTOMATIC RHYTHM INSTRUMENT WITH CYCLE-END TERMINATION CIRCUIT

Eisaku Okamoto, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Mar. 15, 1971, Ser. No. 124,252
Claims priority, application Japan, Mar. 16, 1970, 45/21620
Int. Cl. G10h 5/06, 1/00
U.S. Cl. 84—1.03 3 Claims

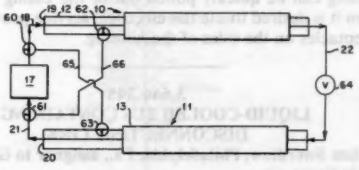


An automatic rhythm instrument is provided with a rhythm termination circuit which keeps the rhythm pattern pulse generator operating even after the stop switch is manipulated and stops keeping it operating upon detecting the end of the rhythm cycle, thus stopping the automatic rhythm performance upon completion of the full rhythm cycle. On this instrument, the player does not have to manipulate the stop switch at the exact end of the rhythm cycle, but has only to manipulate it at any time within the last rhythm cycle and the instrument keeps on the performance until it comes to the final end of the rhythm cycle and stops.

3,646,243
COOLANT CIRCUIT FOR RESISTIVE CRYOGENIC ELECTRIC POWER TRANSMISSION LINE

Peter Graneau, and Joseph L. Smith, Jr., both of Concord, Mass., assignors to Simplex Wire and Cable Company, Burlington, Mass.

Filed Oct. 27, 1969, Ser. No. 869,476
Int. Cl. H01b 7/34
U.S. Cl. 174—15 10 Claims



A coolant circuit for refrigerated electric power transmission cable utilizing coolant in the cable in which capacity to accommodate cyclic peak loads, overloads, and emergency conditions is provided;

1. by operating the cable coolant circuit with a liquid-phase coolant in the cable under superatmospheric pressure and normally maintaining the temperature of the coolant substantially below its vaporization temperature such that cyclic peak loads and temporary overloads and emergencies can be accommodated by the thermal mass of the coolant, i.e. by allowing the temperature of the coolant to rise while maintaining it in the liquid phase,
2. by flashing refrigerant contained in a reservoir located exteriorly of the cable to obtain added cooling capacity in cases of prolonged overload and emergency, and

3. by employing parallel electrical circuits in a common coolant loop such that the entire refrigerating capacity can be utilized to cool one electrical circuit in the event of breakdown of the other.

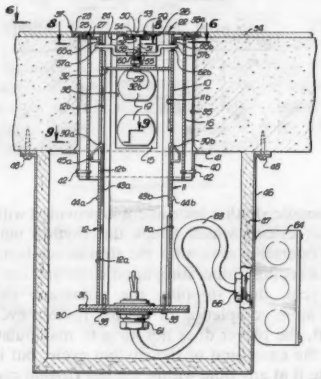
Accommodation to long term increase in required cable capacity is also provided.

3,646,244

ADJUSTABLE FLOOR RECEPTACLE MOUNT

Stephen W. Cole, Altadena, Calif., assignor to C. W. Cole & Co., Inc., El Monte, Calif.

Filed Aug. 21, 1970, Ser. No. 65,778
Int. Cl. H01h *9/02*
U.S. Cl. 174—57 **10 Claims**



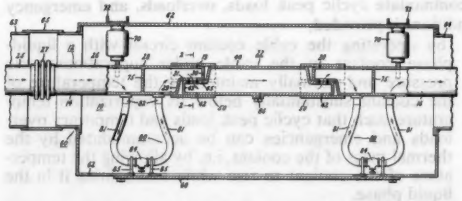
An adjustable floor receptacle mount is provided that includes a housing movable within a stationary casing fitted into a circular opening in a concrete floor. The housing and the casing are each formed of a pair of interlocking extruded channel structures whose walls are shaped to facilitate the installation and operation of the floor receptacle mount. In order to simplify the withdrawing of the housing from a recessed position within the casing, a cap provided on a cover plate for the housing and operating in conjunction with a latching mechanism pops up when the housing is unlatched. The cap thus provides a convenient handle by which the housing can be quickly pulled out of the casing in the floor when it is desired to use the electrical service provided by the receptacles on the sides of the housing.

3,646,245

LIQUID-COOLED BUS CONTAINING A DISCONNECTING LINK

Nathan Swerdlow, Philadelphia, Pa., assignor to General Electric Company

Filed Dec. 16, 1970, Ser. No. 98,697
Int. Cl. H02g *15/20*
U.S. Cl. 174—21 JS **5 Claims**



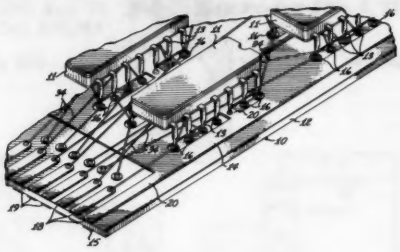
Discloses a liquid-cooled electric bus comprising a pair of hollow bus bar sections interconnected by a removable hollow disconnecting link. The interiors of the bus bar sections and the link are hydraulically interconnected to permit liquid coolant to flow between said bus bar sections via said link. Each bus bar section has a flow-blocking barrier therein and a bypass circuit bypassing the barrier comprising a pair of flexible lines of electrical insulating material and a shutoff valve interconnecting said lines.

3,646,246

CIRCUIT BOARD AND METHOD OF MAKING

Frederick D. Olney, Jr., Phoenix, Ariz., assignor to Honeywell Information Systems Inc.

Filed May 22, 1970, Ser. No. 39,728
Int. Cl. H05k *3/32*
U.S. Cl. 174—68.5 **9 Claims**



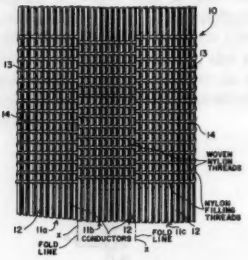
A circuit board and a method of making same, the circuit board having holes formed therethrough in which selected ones of the holes are electrically connected by a method in which conductive wire is sewn into the holes and retained therein to form an electrical connection to conductive material adjacent to the holes.

3,646,247

FOLDABLE WOVEN MULTISTRAND ELECTRICAL CABLE

Kenneth H. Sennett, Humarock, and Alan P. Mandel, Brookline, both of Mass., assignors to Electroweave, Inc., Rockland, Mass.

Filed Jan. 11, 1971, Ser. No. 105,231
Int. Cl. H01b *7/08*
U.S. Cl. 174—117 M **9 Claims**



A longitudinally foldable woven multiconductor cable includes side-by-side sections joined along a longitudinal fold line, each section including single or multiple insulator sheathed conductor warps with or without alternating nonconducting yarn warps. The warps are interwoven by a weft in a common pattern which is altered or shifted at the fold lines to provide hinges between the sections. The weave pattern alteration may be accomplished with a box weave where the warps include alternate conductor and yarn warps by omitting the yarn warp between a pair of successive conduc-

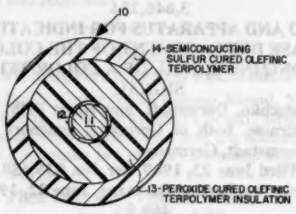
tor warps at the fold line or it may be accomplished with a twill weave by reversing the weave pattern at the fold lines.

3,646,248

ELECTRIC CABLE

Ting H. Ling, and Marwick H. Solomon, both of Marion, Ind., assignors to Anaconda Wire and Cable Company

Filed Feb. 22, 1971, Ser. No. 117,475
Int. Cl. H01b *7/02*
U.S. Cl. 174—120 SC **7 Claims**



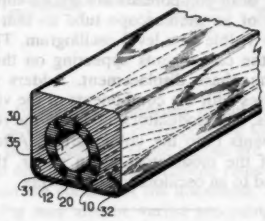
An electric cable is insulated with a cross-linked olefinic terpolymer and has a semiconducting cross-linked olefinic terpolymer jacket closely applied over the insulation. Different curing systems are employed for the insulation and jacket with the result that the jacket will maintain a void-free contact with the insulation but may still be stripped cleanly from it.

3,646,249

SUPERCONDUCTOR

Francois Moisson-Franckhauser, Bretigny-sur-Orge, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed July 14, 1970, Ser. No. 54,714
Int. Cl. H01b *5/00, 7/34*
U.S. Cl. 174—126 **2 Claims**



An electrical superconductor comprises a hollow prismatic member consisting of a cylindrical tube covered with an extra layer of the slightly resistive material to form the external shape, and containing superconductor elements, and a lining of mechanically strong material, fixed onto the prismatic member.

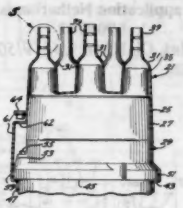
3,646,250

PROTECTIVE BOOT FOR DISTRIBUTOR CAPS AND THE LIKE

Stanley E. Estes, 543 W. 18th Street, Gardena, Calif.

Filed Apr. 1, 1970, Ser. No. 24,585
Int. Cl. H01h *19/06;* **H01r** *13/52*
U.S. Cl. 174—138 F **9 Claims**

A protective boot for an ignition system component housed in a housing having a base with a cap mounted thereon. The cap is of the type which is formed with a plurality of upstanding towers formed with passages for receipt of electrical leads leading from various electrical components in the ignition system. The boot includes a flexible jacket for closely fitting the cap and a plurality of flexible inverted cups for closely overfitting the towers and projecting beyond the upper ends of such towers to form respective nipples defining bores for passage of the electrical leads. The nipples are formed to closely fit the leads to form a seal therearound. A



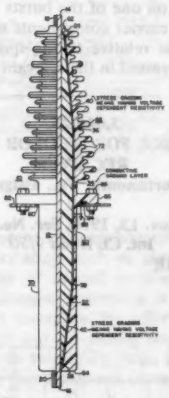
flexible skirt is formed by the lower extremity of the jacket for projection over the joint between the housing base and cap whereby the boot may be installed on the housing to form a tight seal around each of the electrical leads and also over the joint formed between the cap and base to thereby positively seal the electrical component against atmospheric dirt and moisture.

3,646,251

ELECTRICAL BUSHING HAVING STRESS-GRADING LAYER DISPOSED WITHIN SOLID INSULATION INCLUDING A GROUND LAYER TERMINATED AT EACH END WITH A LAYER OF MATERIAL HAVING A VOLTAGE-DEPENDENT RESISTIVITY

Kevin F. Friedrich, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 8, 1970, Ser. No. 96,151
Int. Cl. H01b *17/26*
U.S. Cl. 174—142 **11 Claims**

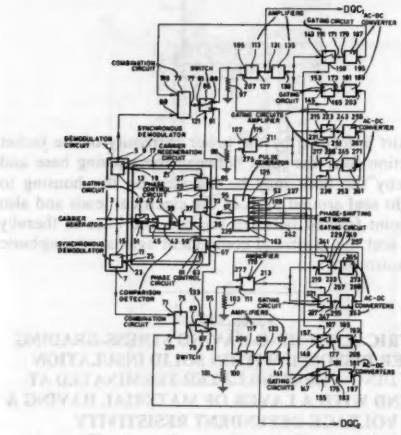


A high-voltage electrical bushing having solid electrical insulation disposed about an electrical conductor, with an axial and radial stress-grading structure disposed within the solid insulation. The stress-grading structure includes a ground layer in the form of a substantially cylindrical band of electrically conductive material disposed coaxially with the electrical conductor, with both ends of the electrically conductive band being connected to stress-grading materials having a voltage-dependent resistivity.

3,646,252
DECODER ARRANGEMENT FOR A SIGNAL TRANSMISSION SYSTEM EMPLOYING INFORMATION TRANSMISSION BY MEANS OF A QUADRATURE-MODULATED CARRIER

Marie Marcel Arnold Antoine Ghislain Verstraelen, and John Richard Reynders, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 8, 1970, Ser. No. 44,315
Claims priority, application Netherlands, June 10, 1969, 6908782
Int. Cl. H04n 9/46, 9/50
U.S. Cl. 178—5.4 SD 5 Claims

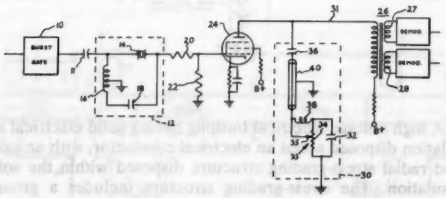


A decoder arrangement for a quadrature-modulated signal having periodically occurring bursts of each of the two quadrature components wherein during the recovery of the two carrier components required for demodulation of the signal—so as to avoid crosstalk between the quadrature components during the demodulation—a double-phase control system each active on one of the bursts is used which maintains each of these carrier components separately accurately 90° shifted in phase relative to the quadrature component which must be suppressed in the relevant demodulator.

3,646,253
TINT CONTROL FOR A COLOR TELEVISION RECEIVER

Robert F. Wood, Portsmouth, Va., assignor to General Electric Company

Filed Nov. 13, 1970, Ser. No. 89,264
Int. Cl. H04n 9/50
U.S. Cl. 178—5.4 HE 6 Claims

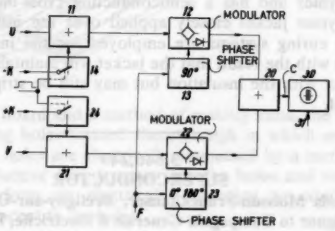


A tint control for a color television receiver comprising means for shifting the phase of the 3.58 MHz. subcarrier reference signal before applying it to a demodulator stage. The resistive element of a potentiometer is connected across a capacitor, one end of the capacitor being connected to ground. An inductor is connected between the end of the potentiometer remote from ground and the slicer thereof, the slider being coupled to the plate of a subcarrier amplifying tube by means of a second, series-connected capacitor. Proper selection of values for the inductor and capacitors allows the use of an inexpensive linear Potentiometer, while providing the desired "flat" response in the midrange of potentiometer adjustment.

3,646,254
METHOD AND APPARATUS FOR INDICATING THE PHASE DISPLACEMENT OF THE COLOR-SYNCHRONIZING SIGNAL OF A COLOR TELEVISION SIGNAL

Gerhard Illetschko, Darmstadt, and Horst Peth, Alsbach an der Bergstrasse, both of Germany, assignors to Fernseh GmbH, Dormstadt, Germany

Filed June 23, 1969, Ser. No. 835,450
Claims priority, application Germany, June 22, 1968, P 17 69 468.9
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 7 Claims

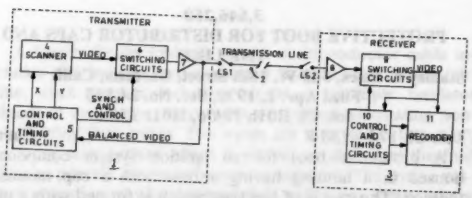


One of the two differently directed modulating components are alternatingly suppressed during predetermined time intervals. Both components are traced superimposingly on the screen of an oscilloscope tube so that they appear simultaneously visible in a level oscillogram. The amplitude difference of the components appearing on the screen is a measure of the phase displacement. Adders combine the identifying pulses with the components of the video frequency color signals, and modulators modulate the resulting combined components onto the color carrier. After combining the outputs of the modulators in an adder, the combined signal is applied to an oscilloscope or viewing.

3,646,255
FACSIMILE SYSTEM

Elliott W. Markow, Burlington, Mass., assignor to Newton Electronic Systems, Inc., Waltham, Mass.

Filed Feb. 20, 1970, Ser. No. 13,087
Int. Cl. H04n 3/30, 7/12
U.S. Cl. 178—6 8 Claims



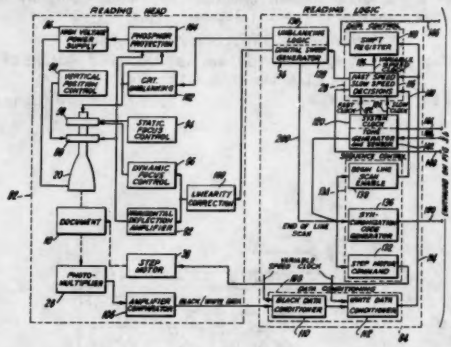
An electronic facsimile system comprising a transmitter including a document scanner, actuated by two deflection

signals, one of which is held fixed while the other is scanned over the copy at a fast rate until data is encountered. When data is encountered, the scanning signal drops back and begins a slow scan until no further data has been found for a predetermined time. In the receiver, a recorder is operated in accordance with two corresponding deflection signals, one of which is fixed, while the second is scanned in time with the transmitter scan. In both transmitter and receiver, the deflection signal that is fixed while the other is scanned is stepped to the next position at the end of the scan, which is reached at a time dependent on the data content of the copy being transmitted and received.

3,646,256
ADAPTIVE MULTIPLE SPEED FACSIMILE SYSTEM

Gerald W. Jacob, Great Neck; Eugene Mogul, East Norwich; Paul Z. Boros, New York; David Schiff, Briarwood, Malcolm Reader, New Hyde Park, and Ira Kamen, New York, all of N.Y., assignors to Comfax Communications Industries, Inc., New York, N.Y.

Filed Mar. 24, 1970, Ser. No. 22,231
Int. Cl. H04n *3/32*
U.S. Cl. 178—6 **25 Claims**



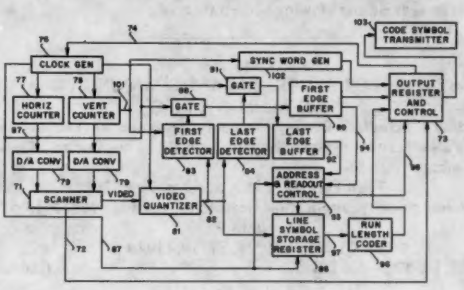
A facsimile transmitter comprises means for scanning a document to produce signals corresponding to the dark and light areas of the document. Those signals are transferred to the receiver at one of two predetermined rates—fast or slow—depending on the content of the document. If desired, the rate of scanning may also be varied according to that content. Signals having a low information value are thereby transmitted at a higher rate than signals having a high information content.

3,646,257
COMMUNICATION SYSTEM HAVING PLURAL CODING VOCABULARIES

Paul Epstein, Brookline; James Cunningham, Cambridge; Robert E. Wernikoff, Belmont, and George Rosen, Brookline, all of Mass., assignors to Electronic Image Systems Corporation, Cambridge, Mass.

Filed Mar. 13, 1969, Ser. No. 806,810
Int. Cl. H04n *1/04*, *1/32*, *1/38*
U.S. Cl. 178—6 **19 Claims**

A system for providing differently coded signals to represent respective different types of information such as the indicia and margin portions of a document. As a result of successive line scans of the document a sequence of message symbols is generated for each line scan in which each sequence is differently coded to respectively represent areas of different nature along the scan line. Typically the areas of different nature are margin and indicia portions of the document. The scanning of the margin areas of the document can

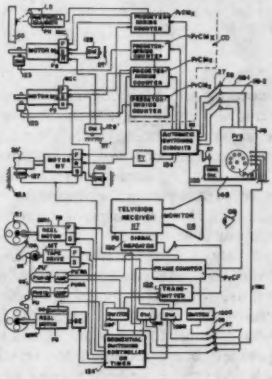


be selectively controlled to minimize coding of areas of margin information.

3,646,258
COMPUTING APPARATUS

Jerome H. Lemelson, 72 Prescott Avenue, Staten Island, 6, N.Y.

Original application June 14, 1955, Ser. No. 515,417, now Patent No. 3,003,109, dated Oct. 3, 1961. Divided and this application Aug. 28, 1961, Ser. No. 142,748
Int. Cl. G03b *21/02*, *23/02*; H04n *7/18*
U.S. Cl. 178—6.6 A **19 Claims**



An information storage and reproduction apparatus is provided in which information such as picture information is stored on a plurality of record members and selectively scanned to generate images in viewable or monitorable form.

In one form of the invention, the information is provided on filmstrip as images and a scanning apparatus therefore is remotely controlled to selectively scan the recordings and generate images on a viewing screen located remote from the record members.

In another form of the invention, the information is recorded as signals defined by variable magnetic recordings in different magnetic recording members and a scanning apparatus is provided in the form of magnetic transducing means which is selectively conveyed to selected magazines containing the record members having different picture signals recorded thereon. The conveying means may be utilized to both scan and drive the record member to generate picture signals.

In yet another form of the invention, magnetic recordings of video picture signals are provided on a plurality of mag-

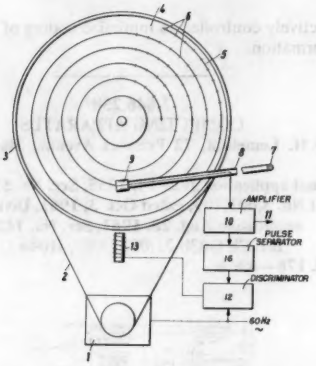
netic cards which are selectively scanned to generate reproductions of the video picture signals which are presented to a monitoring apparatus and utilized to generate still images on the viewing screen thereof.

3,646,259

SYSTEM FOR RECORDING AND SCANNING VIDEO SIGNALS ON A DISC

Eduard Schuller, Berlin, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Donau, Germany

Filed Feb. 12, 1969, Ser. No. 798,720
Claims priority, application Germany, Feb. 13, 1968, P 15 62 038.9
Int. Cl. G11b *19/24, 27/30;* **H04n** *5/78*
U.S. Cl. 178—6.6 DD **6 Claims**



A video recording and scanning system includes a disc-type record, and a record player, the record having both video picture signal producing indicia and synchronizing pulse producing indicia recorded on its spiral track, the length of the track-carrying signals for recording each picture being variable to permit greater compression of information on a given track with short spacings, or greater image resolution detail with long spacings, the number of the pulse indicia having a fixed ratio to the number of individual pictures recorded on the disc, the position of each pulse indicium being fixed relative to the position of the indicia for producing each picture, the record player including a scanning means, a comparison circuit and a disc speed varying means, the scanning means being mounted for relative movement along the track and producing both picture signals and pulse signals, the comparison circuit comparing the frequency of the pulse signals to a reference frequency to produce an adjustment signal, and the disc speed varying means being responsive to the adjustment signal to vary the speed at which the record track moves past the scanning head so that the variable length portions of track-carrying signals for producing one image move past the scanning means in the same period of time and produce a constant picture changing frequency which is independent of the length of the track carrying the signals for producing each picture.

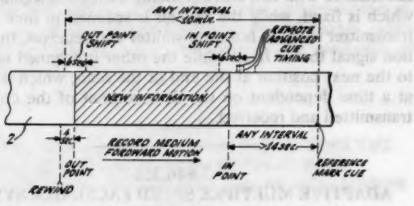
3,646,260

ELECTRONIC EDITING APPARATUS

Thomas V. Bolger, Pennsauken, N.J., assignor to RCA Corporation

Filed Mar. 17, 1969, Ser. No. 807,495
Claims priority, application Great Britain, Mar. 28, 1968, 14,944/68
Int. Cl. G11b *27/08, 27/14;* **H04n** *5/78*
U.S. Cl. 178—6.6 A **8 Claims**

There is disclosed a system operative in conjunction with a video recorder-reproducer, for providing controlled editing of information on a record medium. A desired portion or portions of the recorded information are located, selected



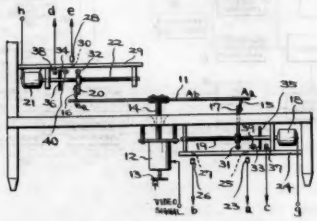
and modified by provision of devices for generating, manipulating and storing data correlated to the information portion to be edited on the record medium.

3,646,261

MAGNETIC RECORDING AND REPRODUCING SYSTEM

Hisao Kinjo, Yokohama; Seiichi Takashima, Kamakura; Takatoshi Kato, Tokyo, and Yoshitaka Iwabuchi, Yokohama City, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 28, 1969, Ser. No. 819,846
Claims priority, application Japan, Apr. 30, 1968, 43/28523
Int. Cl. H04n *5/78;* **G11b** *5/48*
U.S. Cl. 178—6.6 DD **4 Claims**



This is a system for magnetically recording and playing back video signals on a rotating disc-shaped or drum-shaped magnetic medium. A plurality of magnetic heads move alternately and intermittently in a predetermined cycle. The invention permits detection of feed initiation positions, feed completion positions, feed burst positions and feed reset positions of the magnetic heads.

3,646,262

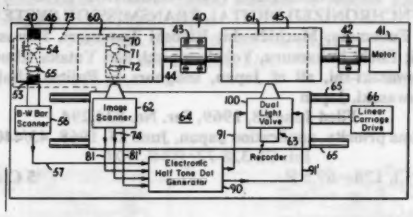
ELECTRONIC REPRODUCTION OF CONTINUOUS IMAGE WITH CONTROLLED MODIFICATION OF IMAGE REPRODUCTION

William West Moe, Stratford, Conn., assignor to Printing Developments, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 625,038, Mar. 22, 1967, now abandoned. This application Mar. 25, 1968, Ser. No. 723,642
Int. Cl. H04n *5/84*
U.S. Cl. 178—6.7 R **36 Claims**

A tonal subject and a bar pattern are synchronously scanned to produce image and dot interval signals later combined to form a dot signal modulating by a light valve the width of a light beam synchronously scanning photosensitive film to expose a halftone image of the subject. Tone edges on the subject cause a shifting of the beam center transverse of

the scanning direction to sharpen such edges as reproduced. Type matter and picture matter may be respectively reproduced in full tone and half tone by appropriate manual or mask control of the scaling factor of the image signal.



3,646,263

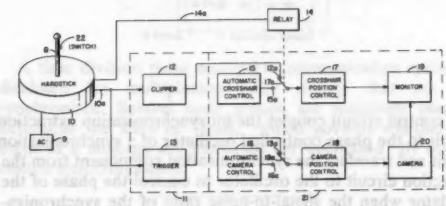
SEMIAUTOMATIC TELEVISION TRACKING SYSTEM

Kilmer L. Hall, Decatur, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 4, 1971, Ser. No. 103,549

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **3 Claims**



Movable crosshairs on a television monitor are controlled by a circuit responsive to manual control, and a television camera is controlled by a circuit responsive to the same manual control. The crosshairs are centered on a contrasting target in the field-of-view of the television system in response to the manual control. The system is then switched to an automatic mode of operation, and moves the crosshairs and the camera to keep the crosshairs on the target, and the target centered in the field-of-view. A hardstick providing outputs directly related to the pressure applied thereto is the manual control.

3,646,264

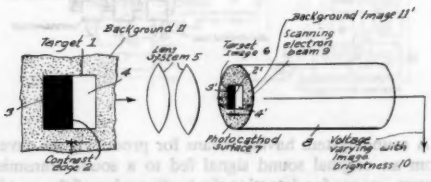
METHOD OF ACQUIRING A MOVING TARGET

John D. Waugh, Abingdon, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 11, 1969, Ser. No. 857,021

Int. Cl. H04n *7/00*

U.S. Cl. 178—6.8 **1 Claim**



In an electro-optical tracking system the target may be brighter than the minimum requirements for tracking but tiny and not large enough to be detected by the electro-optical device. The present method embodies defocusing the image so that it will appear larger and will fill enough of the field to be detectable.

Also, an ordinary target may be faint against a certain type of background and therefore difficult to discern. The present method employs a target with a sharply defined edge between an extra-bright target area and an extra-dark target area. This makes the target discernable against any kind of background. And, more importantly, it makes it possible to accurately detect the edges or outline of one area of the target as sharply contrasted with another area. In a modification for tracking a source of light a mask over the lens provides the sharply defined edge used for high-precision tracking.

3,646,265

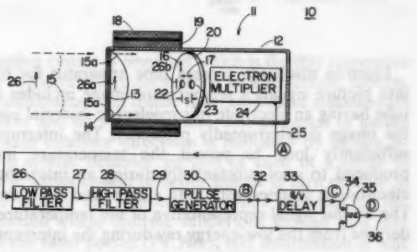
SYSTEM AND METHOD FOR DISCRIMINATING BETWEEN NOISE AND IMAGE SIGNALS

Edward H. Eberhardt, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 28, 1970, Ser. No. 6,629

Int. Cl. H04n *5/36*

U.S. Cl. 178—7.2 **7 Claims**



An image dissector tube having a plurality of apertures thus providing a corresponding plurality of video signal pulses having a predetermined interval therebetween in response to a small input optical image as opposed to single random noise peaks in the output video signal. In the case of two apertures, the output video signal from the image dissector is delayed by substantially the interval between the paired video signal pulses and the delayed and undelayed signals passed to AND gate, thus providing a single output pulse in response to the paired pulses and supressing noise peaks.

3,646,266

TELEVISION ACTIVATED LIGHT DISPLAY

Jon M. Hassell, New York, N.Y., assignor to Lightyears, Inc., New York, N.Y.

Filed June 8, 1970, Ser. No. 44,156

Int. Cl. H04n *9/100*

U.S. Cl. 178—7.85 **7 Claims**

A closely spaced array of forward projecting convex lens elements larger than three-eighths inch in diameter are

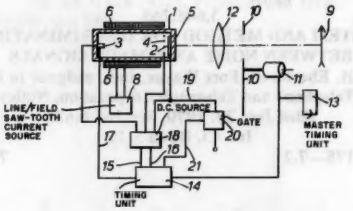
mounted in an opaque screen which is placed over the picture tube of a television so that the lens elements provide a nonobjective light display.

3,646,267

CAMERA SYSTEM FOR PRODUCING A TEMPERATURE IMAGE

Michael Francis Tompsett, Chelmsford, England, assignor to English Electric Valve Company Limited, London, England

Filed July 23, 1970, Ser. No. 57,681
Int. Cl. H04n 5/30
U.S. Cl. 178—7.2 **10 Claims**



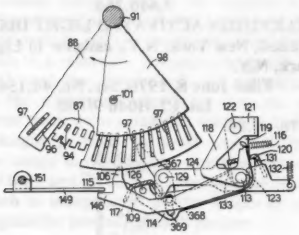
Electron discharge camera tube apparatus for translating into picture signals a temperature image includes a camera tube having an electrode of pyroelectric material upon which the image is interruptedly projected. The interruptions are sufficiently long to permit the temperature image last produced to cool substantially during an interruption. The electrode is scanned with both a high- and a low-energy ray. The output signal representative of the temperature image is derived from the low-energy ray during the interruptions.

3,646,268

CARRIAGE-SHIFTING ARRANGEMENT FOR TELEPRINTERS AND TERMINAL APPARATUS IN GENERAL

Giuseppe Ricciardi, and Bruno Sandrone, both of Ivrea (Turin), Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Mar. 3, 1969, Ser. No. 803,754
Claims priority, application Italy, Mar. 2, 1968, 50742 A/68
Int. Cl. H04l 15/34
U.S. Cl. 178—25 **6 Claims**



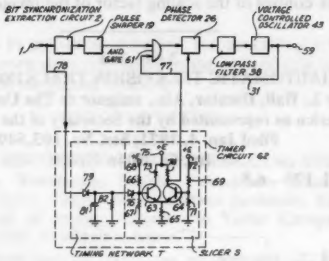
A carriage-shifting arrangement for a teleprinter or other terminal apparatus having a movable carriage. The shifting arrangement includes an actuating means controlled by a code combination for rendering a normally operative carriage shift mechanism inoperative and a normally inoperative carriage-tabulating mechanism including a series of tabulating stops operative, and for rendering at least one counterstop operative to selectively individually contact the tabulating stops for selectively arresting the carriage.

3,646,269

SYNCHRONIZATION CIRCUIT FOR RECEIVING AND REGENERATING TIMING SIGNALS IN A SYNCHRONIZED DIGITAL TRANSMISSION SYSTEM

Isao Fudemoto, Machida-shi; Kiyoshi Tomimori, Kawasaki-shi; Eiichi Nakamura, Yokohama-shi, and Yutaka Kimura, Kawasaki-shi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed June 18, 1969, Ser. No. 834,294
Claims priority, application Japan, June 25, 1968, 43/44068
Int. Cl. 328 72; H04l 7/04
U.S. Cl. 178—69.5 R **5 Claims**



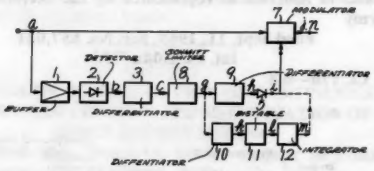
A control circuit couples the bit synchronization extraction circuit to the phase controlled oscillator of a synchronization circuit and transfers the synchronization component from the extraction circuit to the oscillator to control the phase of the oscillator when the signal-to-noise ratio of the synchronization component is at least at a predetermined level and prevents the transfer of the synchronization component to the oscillator to prevent phase control of the oscillator when the signal-to-noise ratio is below the predetermined level.

3,646,270

SOUND SYSTEM

Takeo Shiga; Michio Okamoto, and Osamu Kohsaka, all of Kawasaki-shi, Kanagawa-ken, Japan, assignors to Nippon Columbia Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1969, Ser. No. 861,406
Claims priority, application Japan, Sept. 30, 1968, 43/11014
Int. Cl. H04r 3/04
U.S. Cl. 179—1 D **11 Claims**

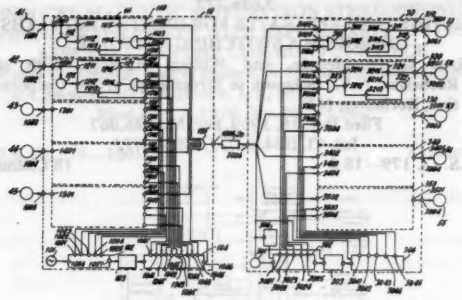


A sound system having means for producing an envelope from an original sound signal fed to a sound transmission system, means for detecting the leading edge of the envelope, and means for instantaneously changing the amplitude of the original sound signal by modulating the original sound signal based upon the shape of the leading edge of the envelope.

3,646,271
PCM RETIMING METHOD

Seiichiro Shigaki, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 24, 1970, Ser. No. 31,567
Int. Cl. H04j 3/06
U.S. Cl. 175—15 BA 7 Claims

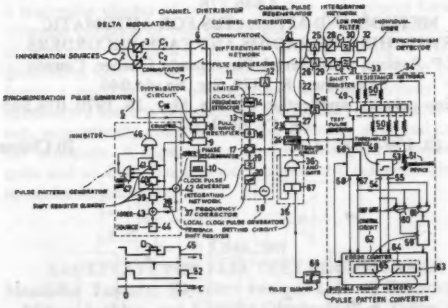


A time division pulse multiplex communication system is disclosed for multiplexing pulse signals that are not synchronized. Several code groups are rotatively used to determine the state of "stuff," which governs whether the digits in a message are increased (or decreased) by one to restore synchronization.

3,646,272
TIME DIVISION MULTIPLEX SYSTEM FOR THE TRANSMISSION OF SIGNALS BY MEANS OF PULSE CODE MODULATION

Malcolm John Kay, Lockeys, South Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1970, Ser. No. 34,817
Claims priority, application Australia, May 16, 1969, 55110/69
Int. Cl. H04j 3/02
U.S. Cl. 179—15 AP 5 Claims

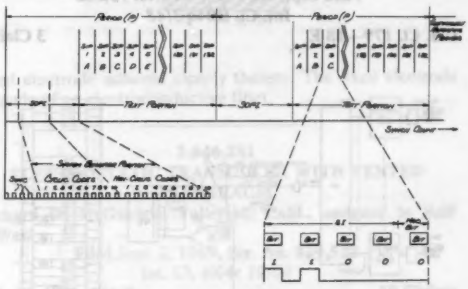


A transmission system for pulse code modulation uses time division multiplex with an improved synchronization system to provide very reliable signal synchronization even in the presence of a high degree of interference.

3,646,273
MULTIPLEX COMMUNICATION SYSTEM AND METHOD FOR MODIFYING SYSTEM BEHAVIOR

Mark T. Nadir, Warren, and Carl N. Abramson, Somerville, both of N.J., assignors to Adaptive Technology, Inc., Piscataway, N.J.

Continuation-in-part of application Ser. No. 861,947, Sept. 26, 1969. This application June 22, 1970, Ser. No. 48,096
Int. Cl. H04j 3/00
U.S. Cl. 179—15 BA 42 Claims

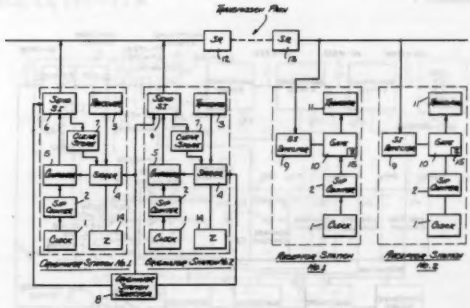


An adaptive system is provided which is flexibly responsive to system behavior information, such as instructions, reports, remote maintenance and traffic flow, command transmission or reception, and data modification. The presence or nature of the system behavior directives is indicated by signals inserted in a system behavior portion of each of a series of periods (P). These system behavior signals in turn operate to modify or change the implicit or explicit meaning of the signals inserted within discrete subperiods located in a text portion of the same period (P). Also, text information is sent by assigning message meanings individually to each of such discrete subperiods, and inserting into selected ones of such subperiods signals identifying receiving and/or sending members of the system. The receiving member, in response to the signals within both the text portion and the system behavior portion, derives the message meanings corresponding to the received subperiods and modifies its behavior accordingly.

3,646,274
ADAPTIVE SYSTEM FOR INFORMATION EXCHANGE

Mark T. Nadir, Warren, and Carl N. Abramson, South Boundbrook, both of N.J., assignors to Adaptive Technology, Inc., Piscataway, N.J.

Filed Sept. 29, 1969, Ser. No. 861,947
Int. Cl. H04j 3/00
U.S. Cl. 179—15 BA 64 Claims



A distributed-control multiplex system is disclosed in which individual discrete subperiods within a repetitive period are assigned respective words or message meanings

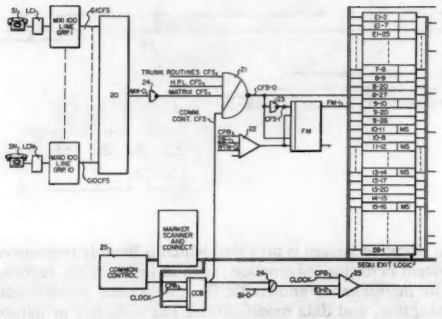
from the system vocabulary. Information transfer between stations occurs by inserting into the subperiod assigned to the desired word or meaning to be transmitted the address of the receiving and/or sending station.

3,646,275

BUSY PERIOD MARKER SPEEDUP SYSTEM

John R. Vande Wege, Glen Ellyn, Ill., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Sept. 25, 1970, Ser. No. 75,585
Int. Cl. H04q *3/48*
U.S. Cl. 179—18 E **3 Claims**



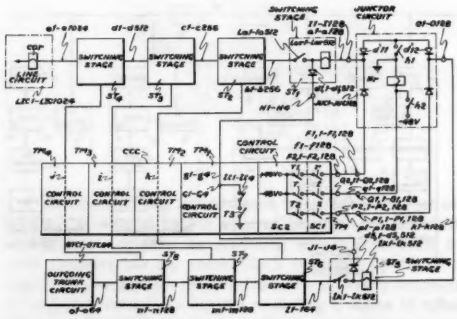
A telephone switching system matrix arrangement controlled by a marker to complete communication connections therethrough. That portion of the marker responsive to a call for service, is shown and a call for service test arrangement. This test circuit is effective to initiate the operation of other circuitry to accelerate the marker operation when a call for service is present at the time a marker is completing the servicing of a prior call by omitting certain operations thereof.

3,646,276

AUTOMATIC SWITCHING SYSTEM, SELECTING SYSTEM AND CHECK CIRCUITS

Andre Ernest Antoon Lauwers, Muizen, and Marcel Arthur Van Brussel, Hoboken, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of application Ser. No. 698,463, Jan. 17, 1968, now abandoned. This application Dec. 22, 1970, Ser. No. 100,762
Int. Cl. H04q *3/42*
U.S. Cl. 179—18 GE **1 Claim**



This case concerns a marker arrangement including a plurality of marker circuits built up as two-coordinate matrices and each grouping all the marking terminals adapted to mark pairs of distinct switching stages involved in the establishment of path of different types, e.g. path between junctor inlets and line circuits and between junctor outlets and outgoing trunks. Advantage: Gain of material

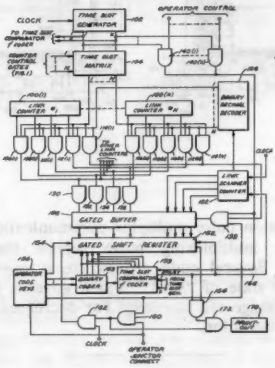
Simple code check circuits may be associated to the matrices. This case also discloses a selecting system and check circuits.

3,646,277

METHOD AND APPARATUS FOR IDENTIFYING PATHS THROUGH A SWITCHING NETWORK

Klaus Gueldenpfennig, and William Hastings, both of Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,067
Int. Cl. H04m *3/22*; H04q *3/72*
U.S. Cl. 179—18 J **18 Claims**



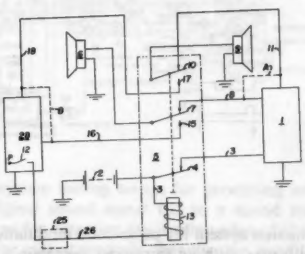
A telephone system including a switching network wherein memory circuits are provided for each of the links in the switching network to identify and select cross-points for providing connections through the switching network. Each link that forms a portion of a connection through the network is assigned a time slot corresponding to that assigned to its connected junctor circuit. The cross-points in each connected link of a particular connection are identified by scanning the memory circuits of the links assigned to a common time slot.

3,646,278

METHOD AND APPARATUS FOR AUTOMATIC SWITCHING OF RADIOS AND TAPE-RECORDERS

Rolf P. Panizzi, 5020 Hertel, Pierrefonds, Quebec, Canada

Filed June 8, 1970, Ser. No. 44,040
Claims priority, application Canada, Mar. 26, 1970, 078,505
Int. Cl. H04b *1/20*
U.S. Cl. 179—100.11 **20 Claims**



There is provided automatic switch means responsive to an audio output or an 'on' state of an audio unit for turning off

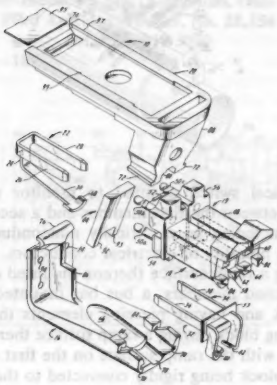
the power supply to another audio unit and concomitantly diverting or switching the output from the first-mentioned audio unit to the electrical-acoustic transducer which was previously supplied from the output of the second-mentioned audio unit. The invention has particular, but not inclusive, use in turning off an automobile radio when a tape-recorder is switched on and switching the outputs so that a common loudspeaker system may be used.

3,646,279

INDUCED MAGNETIC MOVING IRON STEREOPHONIC PHONOGRAPH PICKUP WITH REPLACEABLE STYLUS ASSEMBLY AND ONE COMMON POLE PIECE

Walter O. Stanton, Laurel Hollow, N.Y., assignor to Pickering & Company, Inc., Plainview, L.I., N.Y.

Filed Dec. 7, 1970, Ser. No. 95,562
Int. Cl. H04r *11/12*
U.S. Cl. 179—100.41K **7 Claims**



A stereophonic phonograph pickup of the magnetic type is disclosed wherein the stereophonic output is produced by an elongated tubular armature of permeable material pivotally mounted at one end for movement of its opposite end within a triangular cluster of pole pieces. The pole pieces form the terminal portions of two closed path magnetic circuits, each of which is completed through a core having a voltage-generating coil wound thereabout. One of the pole pieces forms a portion of a common leg for both circuits. Magnetomotive force is provided by a stationary permanent magnet, magnetically coupled with the pivotally mounted end of the armature. A capacitance device is coupled between the coils and an inductance device couples the magnetic circuits to minimize crosstalk.

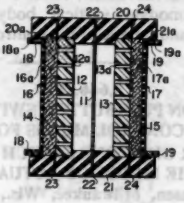
3,646,280

BACKPLATE FOR ELECTRET LOUDSPEAKER

Masahiko Tamura; Kiyonori Iwama, both of Tokorozawa; Mitsuo Asahina, and Kensuke Okuda, both of Tokyo, all of Japan, assignors to Pioneer Electronic Corporation, Ohtaku, Tokyo, Japan

Filed Aug. 26, 1970, Ser. No. 67,187
Claims priority, application Japan, Aug. 28, 1969, 44/67613
Int. Cl. H04r *19/02*
U.S. Cl. 179—111 E **6 Claims**

An electrostatic electroacoustic transducer comprising a vibrating film, an electret having many small holes and a



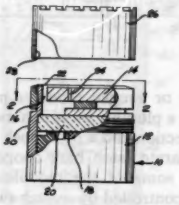
fixed electrode adhered closely thereto. The fixed electrode is made of an electroconductive fiber.

3,646,281

ELECTROSTATIC TRANSDUCER WITH VENTED DIAPHRAGM

Richard D. McGunigle, Fullerton, Calif., assignor to RdF West

Filed June 2, 1969, Ser. No. 829,522
Int. Cl. H04r *19/04*
U.S. Cl. 179—111 R **10 Claims**



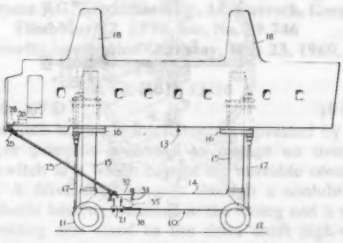
An acoustic pressure transducer wherein a thin metallic diaphragm is mounted in close proximity to a backplate and electrically insulated therefrom to form a capacitor which is variable in capacity in response to variations in acoustical pressure, and at least one capillary aperture is effected through the diaphragm to thereby reduce differentials in static air pressure on opposite sides of the diaphragm.

3,646,282

VEHICLE CONTROL LINE CONNECTIONS

James M. Herring, Jr., Merion Station, Pa., assignor to Boothe Airside Services, Inc.

Filed Dec. 29, 1969, Ser. No. 888,700
Int. Cl. H02g *11/00*
U.S. Cl. 191—12 R **7 Claims**



This application discloses control line connections between a chassis and an elevatable body thereon wherein the line terminals on chassis and body are spaced laterally relative to

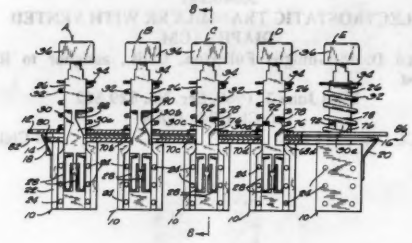
each other and wherein flexible control lines between terminals are supported on rigid bar or beam means which at one end has lateral movement relative to the adjacent terminal to accommodate vertical body movements with minimum flexing and fatigue of the control lines.

3,646,283

MULTISTATION PUSHBUTTON SWITCH ASSEMBLY WITH MASTER CONTROL MEANS FOR ALTERNATIVE PUSH-PUSH OR ONLY ONE SWITCH OPERABLE AT A TIME MODES OF ACTUATION

Eric George Hansen, Milwaukee, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Apr. 20, 1970, Ser. No. 29,858
Int. Cl. H01h 9/26
U.S. Cl. 200—5 EB **14 Claims**



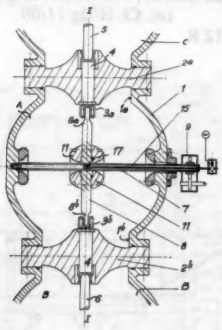
A multistation or ganged modular pushbutton switch assembly including a plurality of switch modules having a slider bar with a cam section and a push-push actuation mechanism thereon and separate latch bars cooperating with the cam sections so that some of the modules acting as operating modules can be controlled by master switch modules to have either a push-push action, momentary action or are interlocked so that one must be actuated to deactuate the other.

3,646,284

HIGH-VOLTAGE CIRCUIT BREAKERS

Yves Bokshorn, Villiers, and Jean-Pierre H. Boudiak, Gagny, both of France, assignors to COQ-France, Pantim, France

Filed Jan. 15, 1971, Ser. No. 106,811
Claims priority, application France, Jan. 14, 1970, 7001182
Int. Cl. H01h 31/00
U.S. Cl. 200—48 R **10 Claims**



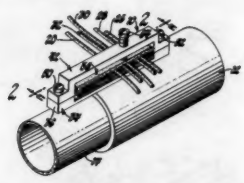
A disconnecting means for very high-voltage electrical installations, comprising a metallic enclosure for containing dielectric fluid, at least two electrical contact members each connected through insulating crossmembers to an exterior conducting element of the circuit to be disconnected, at least one earthed contact jaw, and a movable connecting element adapted to interconnect the two contact members of said circuit in one of its positions and of being earthed in another position, characterized in that said movable element carries a metallic guard part with which it is in permanent electrical connection, said guard part, when the moving element is earthed, automatically and jointly with the movable element assuming the role of a protective screen at earth potential, by being interposed between the contact members.

3,646,285

CONDITION-MONITORING ELECTRICAL SWITCH

Robert C. Farrell, Saginaw, and Thomas J. Milton, Bay City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1971, Ser. No. 118,906
Int. Cl. H01h 3/16
U.S. Cl. 200—61.08 **3 Claims**



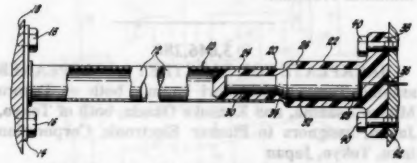
An electrical switch adapted to monitor relative axial movement between the first member and a second member, the switch including an electrically nonconductive housing supporting a plurality of electrical conductors, a first sliding block having a ramp surface thereon mounted on one of the first and second members, a bus bar mounted on the first sliding block and having piercing elements thereon, and a second sliding block having a ramp surface thereon in sliding engagement with the ramp surface on the first sliding block, the second block being rigidly connected to the other of the first and second members. In response to relative axial movement between the members, the second sliding block wedgingly moves the first sliding block to a position wherein the piercing elements breach the housing and simultaneously contact each conductor so that an electrical potential on any one conductor is applied to all of the conductors.

3,646,286

SHEARING CONTACT SWITCH

Sanford L. Maddy, Middletown, and Jackson R. Templin, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 15, 1971, Ser. No. 124,324
Int. Cl. H01h 9/00
U.S. Cl. 200—61.08 **4 Claims**



A switch for closing an electrical circuit upon relative movement of a pair of members includes a hollow cylindrical tube mounted adjacent one end to one of the members. The other end of the tube is provided with a sharpened edge. A

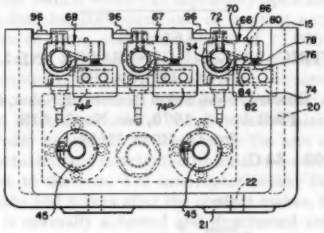
support member of shearable insulating material is mounted to the other member and includes a first cylindrical portion receiving and piloting the free end of the tube and a second adjacent cylindrical portion of larger diameter. In one embodiment, a second contact member includes a first cylindrical portion embedded within the first portion of the support member and a second larger cylindrical portion embedded within the second portion. Upon relative movement of the members, the sharpened edge of the tube shears off the outer layer of the second portion and engages the second portion of the second contact member to close a circuit across a source of power. In another embodiment, a rod extends through both portions of the support member and spaced contacts are embedded within the second portion in the path of movement of the tube for electrical contact thereby when the tube shears off the outer layer of the second portion of the support member.

3,646,287

MICROSWITCH OPERATOR STRUCTURE INCLUDING ADJUSTABLE CAM FOLLOWER

Lawrence E. Beal, Wadsworth; Earl D. Miller, Tallmadge, and William R. Craig, Akron, all of Ohio, assignors to Eagle-Picher-Industries, Inc., Cincinnati, Ohio

Filed Apr. 3, 1970, Ser. No. 25,356
Int. Cl. H01h *3/00*
U.S. Cl. 200—18 **12 Claims**



A switch bank adapted for controlling the operation of multiple switches each of which is adapted to control multiple electrical circuits. The bank includes a plurality of adjustable switch actuators which are preset at a predetermined linear distance from a common reference point. Each actuator is capable of being preset independently of the other actuators. A movable member progressively operates the actuators, whereby the circuits controlled by the respective switches can be operated in accordance with a prearranged plan.

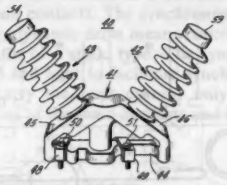
3,646,288

DISCONNECT SWITCH UTILIZING INSULATING BASE HAVING INTEGRALLY FORMED INSULATOR BUSHINGS

Robert E. Perry, Scottdale, and Eugene Gorin, Greensburg, both of Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Aug. 31, 1970, Ser. No. 68,108
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **7 Claims**

A hook disconnect switch having a base member formed of an insulating material and insulator units integrally joined thereto. Two insulators are aligned at an angle relative to one another and support the jaw and pivoting end of a switch blade. The orientation of the insulators significantly reduce cantilever forces imposed by horizontal incoming lines upon the insulators. The base member provides a means for rigidly positioning and supporting the hook switch assembly, as well as enhancing the dielectric strength of the insulators. The design and orientation of the insulators further reduce overall



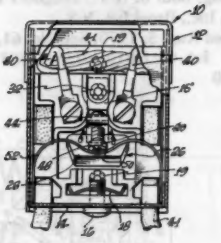
switch size and considerably reduce the effect of contamination for all mounting positions of the switch.

3,646,289

DEVICE RESPONSIVE TO MOTION AND TAMPERING

Burnie M. Craig, Pasadena, Calif., assignor to Paramount Industries, Paramount, Calif.

Filed May 8, 1970, Ser. No. 35,641
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.47 **4 Claims**



A device to be mounted on a fence, or other structure, and adapted to switch a circuit, such as an alarm circuit, in response to excessive motion of the fence and/or in response to tampering with the device in an effort to inactivate it. The device includes a housing having a removable closure and containing a single, normally closed switch connected in an alarm system, means responsive to removal of the closure for opening the switch to actuate the alarm system, and means responsive to excessive motion of the housing for opening the switch to activate the alarm system.

3,646,290

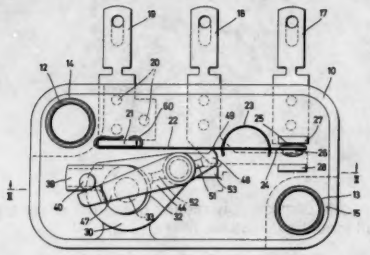
MICROSWITCH WITH PIVOTAL MICROCONTACT ACTUATOR

Wilhelm Peter Borgmann, Overath, Germany, assignor to W. P. Borgmann KG, Kreuzfahrerstr. 14, Overath, Germany

Filed May 22, 1970, Ser. No. 39,746
Claims priority, application Germany, May 23, 1969, G 69 20 813.5
Int. Cl. H01h *13/36*
U.S. Cl. 200—67 D **19 Claims**

A microswitch having a microcontact operated by an actuating lever pivotally mounted to engage an overcenter snap-type switch arm which carries the movable contacts of the switch. A drive shaft extends through a nonlubrication requiring plastic bearing mounted in the casing and is rotated by an operating arm fixed to the drive shaft high-voltage pivotally between motion limiting stops on the outside of the casing. A cam connected to the inner end of the drive shaft engages one end of the actuating lever to pivot the lever against the overcenter snap arm to cause the contacts to switch. The elements of the switch are mounted in a two part

casing held together by rivets and having electrical connecting lugs molded or otherwise embedded in the insulating material of the casing. The casing is enlarged at strategic



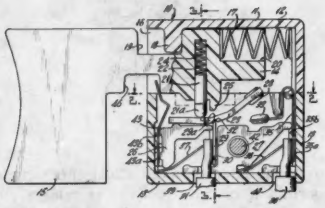
places and the components are so arranged that the danger of flashing and tracking is substantially eliminated even when the switch is used for high voltage operation.

3,646,291

TEASE-PROOF ELECTRIC SWITCH

Wolfgang F. Bienwald, Huntington Station, and William J. Bowie, Flushing, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,376
Int. Cl. H01h *13/36, 13/08*
U.S. Cl. 200—70 **9 Claims**



The invention relates to a tease-proof electric switch in which the switch contacts cannot be partially opened or closed by manipulation of the mechanism. The switch employs a contact-carrying rocker which moves positively between open and closed positions of the switch under the influence of forces exerted thereon by an operating member.

Movement of the rocker between open and closed positions of the switch is restrained by a releasable latch. Opening and closing of the switch contacts takes place upon release of the latch from engagement with the rocker as the result of forces exerted on the rocker by the operating member. Opening and closing of the switch contacts also takes place positively and quickly with arcing being held to a minimum.

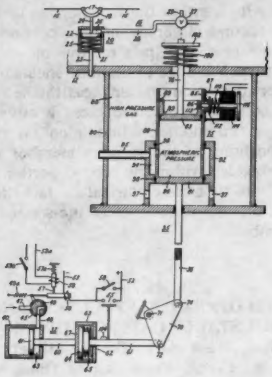
3,646,292

HIGH-VOLTAGE ELECTRIC CIRCUIT BREAKER WITH HIGH-SPEED TRIPPING MEANS

Philip Barkan, and Joseph W. Porter, both of Media, Pa., assignors to General Electric Company

Filed May 11, 1970, Ser. No. 36,288
Int. Cl. H01h *35/38, 33/82*
U.S. Cl. 200—82 B **12 Claims**

Discloses a high-voltage circuit breaker comprising a control device at high potential operable to produce separation of the usual contacts of the breaker, an operator at ground potential for operating the control device, and a linkage mechanically connecting the operator and the control device. The linkage comprises a releasable coupling at a location of substantially line potential that is releasable to allow the control device to be operated independently of the operator.



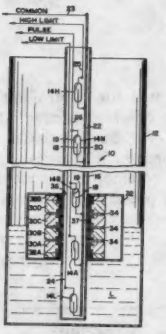
Latch means normally prevents coupling-release but is operable in response to predetermined electrical conditions to release the coupling and allow high-speed operation of the control device before the operator operates.

3,646,293

ELECTRICAL SIGNAL GENERATOR AND LIQUID LEVEL INDICATOR

William A. Howard, 6666 Solon Boulevard, Solon, Ohio

Filed Apr. 6, 1970, Ser. No. 25,818
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 C **17 Claims**



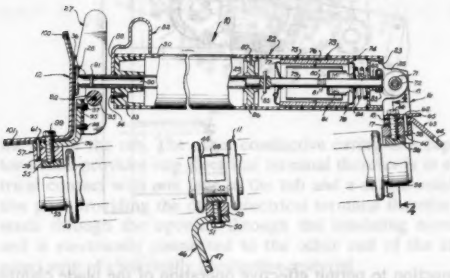
One or more magnetically operable switches are each actuated a plurality of times by a series of actuating magnets moved past the switch or switches. The switches generate signals indicative of the movement of the magnets. A surface of each magnet that moves past the switch or switches includes a north and south pole portion, and like poles of successive magnets are adjacent each other to open the switches as well as close them under magnetic force. At each end of the series of switch-actuating magnets there is a magnet of lesser strength that constrains the field of each end magnet to a zone substantially equal to that of the intermediate magnets and prevents premature actuation of a switch as the magnets approach. A preferred circuit produces a separate electrical pulse each time a switch is opened and each time it is closed. In a particular application of the mechanism, the magnets are carried by a float in a liquid-containing vessel past stationary

switches as the liquid level changes. Pulses produced by the switches indicate the position of the float.

3,646,294
SWITCH

George Randall McCloud, San Jose, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,023
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **13 Claims**

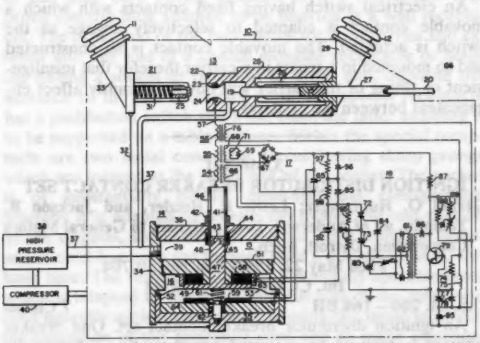


A loadbreak switch which can repeatedly open and close a circuit to a load for 200 operations or more at a current of 300 amperes or more and at a voltage of 13,000 volts or more. The switch includes two conductors connected from two fixed terminals. An arm is pivoted from one terminal and has a contact at its free end to engage the other terminal. The contact is mounted on the end of a shaft slidable in the arm. A vacuum interrupter is mounted in the arm in a position to be actuated and deactuated by axial movement of the shaft relative to the arm. The interrupter breaks before the contact breaks and makes after the contact makes. Since the interrupter is normally actuated and deactuated axially, the switch is uncomplicated, inexpensive, requires few parts and is compact.

3,646,295
SYNCHRONOUS CIRCUIT INTERRUPTER

Robert Ray Circle, Woodbridge, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1970, Ser. No. 12,206
Int. Cl. H01h *33/82*
U.S. Cl. 200—148 J **7 Claims**

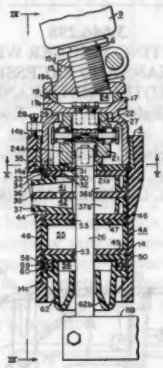


In a circuit breaker, main current carrying contacts are in parallel with secondary or synchronous interrupter contacts, and an isolating switch is in series with both the main contacts and the synchronous interrupter. The synchronous interrupter is switched into the circuit when the main contacts open and interrupts the current at a current zero after the opening of the main contacts. The synchronous contacts are operated by electrodynamic drive means controlled by a current zero anticipator of a static type. The synchronous contacts can be small and light to facilitate synchronous operation since they carry the fault current only for the time between the opening of the main contacts and interruption of the fault.

3,646,296
CIRCUIT INTERRUPTER GRID STRUCTURE FOR OIL-BREAK CIRCUIT INTERRUPTER

Robert L. Hess, E. McKeesport, and Gerald D. Summers, Greensburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1968, Ser. No. 703,410
Int. Cl. H01h *33/68*
U.S. Cl. 200—150 R **13 Claims**



An oil-type circuit breaker has three poles provided in a unitary tank structure, each pole comprising a pair of serially related grid structures. The grid structures are constructed by nesting a plurality of plate elements, constituting vent passages and oil pockets, within an outer cylindrical glass-filament-wound shell. The stationary contact assembly is so arranged as to have a lengthened finger, which serves as an arcing horn disposed adjacent side lateral vent openings. The vent openings are formed by molded vent elements of particular materials and having a splitter plate interposed therebetween. Additional oil pockets and a lower oil-pocket plug, having an entrance opening, assist in guiding the movable contact rod, and additionally providing considerable turbulence within the oil during the opening operation.

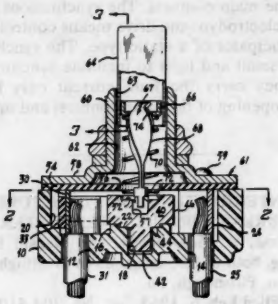
3,646,297
PUSH SWITCH, ESPECIALLY FOR AC USE

Walter H. Anthony, Levittown, Pa., assignor to Circle F Industries, Inc.

Filed July 16, 1970, Ser. No. 55,309
Int. Cl. H01h *3/00*
U.S. Cl. 200—153 LB **2 Claims**

A push switch in which there is step-by-step advancement of a rotary cam. The cam configuration acts on a movable contact to effect a fast-make, slow-break action. Cooperating ratchets on the cam and switch body index the cam and have a shape that builds in a "time tolerance" such that the indexing of the cam need not coincide perfectly with the drop-off of the movable contact to the "make" position. A coil spring

incorporated in a motion translating mechanism between the button and cam is placed under added compression when the



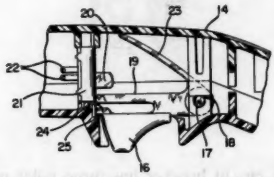
indexing ratchets approach coincidence, accelerating the "-fast make."

3,646,298

SWITCH OPERATING TRIGGER WITH INTEGRAL BIASING MEANS AND EXCESSIVE FORCE PROTECTION MEANS

Edwin J. Weber, Baltimore, and Roderick F. Bunyea, Cockeysville, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 25, 1970, Ser. No. 66,830
Int. Cl. H01h *3/48, 9/06*
U.S. Cl. 200—157 **4 Claims**



A grass trimmer having an electric motor, a rotary blade, a handle extending from the motor, and a trigger switch in the grip portion of the handle. The trigger switch includes an ON-OFF switch for applying power to the motor and a trigger member. Integral with the trigger member is a resilient extension which abuts a fixed surface in the handle to provide a force biasing the trigger in the off direction to provide an improved "feel" for the operator and providing safer operation by avoiding a hair trigger effect.

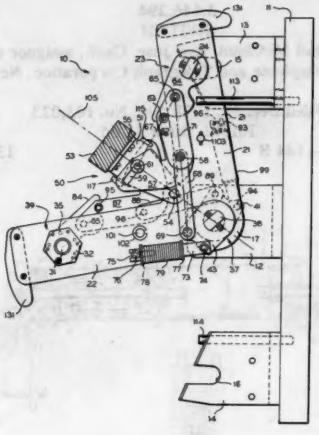
3,646,299

POLE MECHANISM FOR DOUBLE-THROW PRESSURE CONTACT SWITCH

Manfred Stene, Chicago, Ill., assignor to Erickson Electrical Equipment Co., Chicago, Ill.

Filed Aug. 27, 1970, Ser. No. 67,524
Int. Cl. H01h *1/38*
U.S. Cl. 200—162 **6 Claims**

A pole mechanism for a double-throw pressure contact switch comprising a V-shaped movable contact member pivotally mounted on a center terminal, the two blades of the movable contact member being engageable with respective end terminals. A unified actuating means, comprising a main actuating lever and two sets of overcenter biased toggle linkages, is employed to throw the switch and to clamp the blades to the switch terminals whenever the switch is fully thrown. The motion of the actuating lever is along a simple, continuous path. Each toggle linkage includes a lost-motion



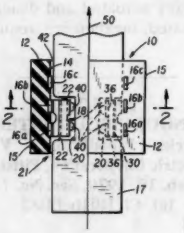
connection to permit effective operation of the blade clamps by one linkage without breaking the other toggle.

3,646,300

CONTACT SWITCH

Noboru Manabe, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1970, Ser. No. 26,934
Claims priority, application Japan, Nov. 19, 1969, 44/109811
Int. Cl. H01h *1/46, 1/50*
U.S. Cl. 200—166 D **9 Claims**



An electrical switch having fixed contacts with which a movable contact is adapted to selectively engage as the switch is actuated. The movable contact is so constructed and so mounted in a recess in a carrier therefor that misalignment or tilting of the carrier will not significantly affect engagement between the contacts.

3,646,301

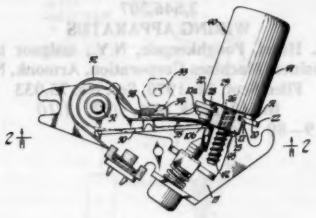
IGNITION DISTRIBUTOR BREAKER CONTACT SET

Gerald O. Huntzinger; Lewis R. Hetzler, and Jackson R. Templin, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 22, 1970, Ser. No. 39,704
Int. Cl. H01h *1/00, 19/28*
U.S. Cl. 200—166 BH **7 Claims**

An ignition distributor breaker contact set. One breaker contact is secured to a slotted tab extending substantially normal to a support member and the other breaker contact is secured to a pivotally mounted breaker arm which is operable to place the breaker contacts into electrical contact en-

gagement. An elongated strip of electrically conductive material having a longitudinal slot which provides breaker arm and breaker contact clearance extends substantially parallel to the breaker arm from a point on the breaker arm between the pivot and the breaker contact at which one end is electrically connected to the breaker arm and terminates adjacent an opening through an insulating member located in



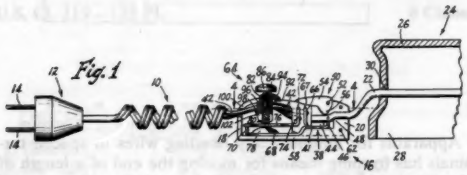
the slot of the tab. The outer conductive casing of a capacitor which provides one electrical terminal therefor is in electrical contact with one face of the tab and a center conductive post providing the other electrical terminal therefor extends through the opening through the insulating member and is electrically connected to the other end of the elongated strip of electrically conductive material.

3,646,302

ELECTRIC LAMP REPLACEMENT CORD WITH DELAY ACTION SWITCH

Herbert G. Lehmann, 5 Kent Road, Easton, Conn.

Filed July 6, 1970, Ser. No. 52,614
Int. Cl. H01h *43/00, 1/50*
U.S. Cl. 200—168 E **12 Claims**



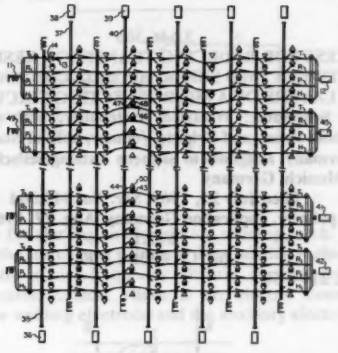
A quick replacement automatic slack takeup electric cord for small appliances such as lamps, radios and the like, comprising a length of two-conductor plastic lamp cord which is preferably coiled and semipermanently set in a helix, one end of the lamp cord having attached to it a convention two-prong electric plug adapted to be inserted in a wall receptacle. The other end of the two-conductor cord carries and extends into one end of a special elongate receptacle or housing having a socket or recess at its other end, opposite the entrance of the two-conductor cord. The special receptacle has a pushbutton switch and a flat base, the latter enabling it to be supported on a table surface. Within the special receptacle are two metal connector pieces having sharp prongs which are located at the inner end of the socket. The socket is of substantially oblong cross-sectional configuration whereby it is adapted to receive the freshly cut end portion of the original, somewhat flat electric cord from the lamp, which cord has been cut through with a scissors close to the lamp base. The receptacle also has a manually operable lever which is adapted to force the said cut end of the appliance cord laterally against the prongs, causing the latter to pierce the insulation of the appliance cord and to make electrical connections thereto. The switch of the special receptacle has a time delay device which delays the shutoff of the lamp. When the user switches off the lamp, a delay of several moments is experienced before circuit is opened.

3,646,303

CONTACT ARRANGEMENT IN COORDINATE SWITCHES

Bloomfield J. Warman, Milan, Italy, assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed July 16, 1970, Ser. No. 55,503
Int. Cl. H01h *67/02*
U.S. Cl. 200—177 **5 Claims**



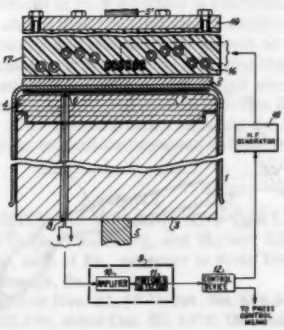
Multiple bars, arranged in rows and columns, extend through different banks of a switch assembly and comprise fixed contacts to be engaged directly by adjacent movable contacts. The movable contacts extend from the faces of conductive flexible strips that are suspended between rows of the multiple bars. Operation of a first actuator flexes the contact strips of a selected column of a switch bank toward respective multiple bars, and operation of a second actuator moves the flexible strips of selected rows longitudinally such that detent prongs near respective selected contacts function as inclined planes to complete engagement of the selected contacts. Each selected contact is held closed as long as only the second actuator is operated.

3,646,304

INDUCTIVELY HEATING BRAZING PRESS

Bernard Dallet, Savigny-sur-Orge; Jacques Doucerain, Paris, and Jean Moulin, Ris-Orangis, all of France, assignors to Societe de Traitements Electrolytiques et Electrothermiques (S.T.E.L.)

Filed July 13, 1970, Ser. No. 54,250
Claims priority, application France, May 14, 1970, 7017658
Int. Cl. H05b *5/00*
U.S. Cl. 219—6.5 **3 Claims**



A mandrel, to hold the article to be heat treated and pressed, for example to hold a workpiece to form a cooking utensil, to which a bottom of highly heat-conductive material

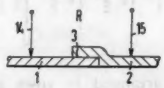
is to be applied, has a longitudinal opening formed therein through which a thermal-electric transducer, for example a thermocouple can be inserted, and its connections taken off, or, through which heat at the plate itself can be measured by infrared radiation. The thermocouple is connected to the control apparatus for the heater to cut application of electrical energy to an induction heater when tee heat at the interface of the mandrel, or an inserted thin heat-conductive sensing plate exceeds a predetermined value.

3,646,305

PROCESS FOR REDUCING TRANSITION RESISTANCE BETWEEN TWO SUPERIMPOSED, CONDUCTING LAYERS OF A MICROELECTRIC CIRCUIT

Martin Schmidtke; Winfried Ruttenauer, both of Munich; Reinhold Penzl, and Brigitte Vollmer, both of Starnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 25, 1969, Ser. No. 845,004
Claims priority, application Germany, Aug. 27, 1968, P 17 90 023.1
Int. Cl. B23k *11/00*
U.S. Cl. 219—50 3 Claims



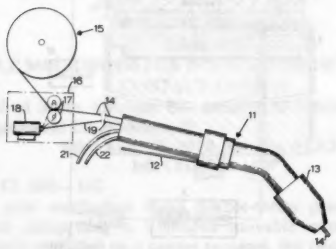
A method for reducing transition resistance between two superimposed conducting layers of a multilayered microelectronic circuit, in which there is applied to the two conducting layers an electrical energy having a magnitude below that causing a destruction of the conducting layers involved, such energy preferably comprising a potential within the range of 1 to 20 volts derived from an energy source comprising a charged electrical capacitor.

3,646,306

ARC GOUGING SYSTEM

Edwin W. Olds, 3105 High Street, Oakland, Calif.

Filed Apr. 24, 1970, Ser. No. 31,607
Int. Cl. B23k *9/16*
U.S. Cl. 219—70 1 Claim



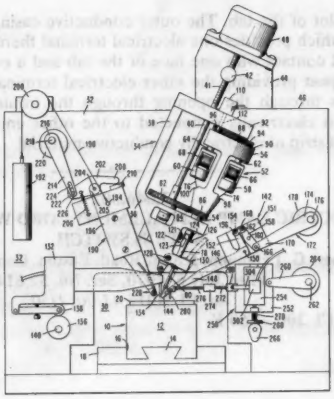
An air arc gouging system having means continuously feeding a thin walled tube filled with finely divided graphite as a flexible electrode into an arc to a workpiece and means directing gas at a high velocity on to the workpiece at the arc. A substantial length of electrode is coiled or wound as upon a drum for extended continuous gouging operations.

3,646,307

WIRING APPARATUS

Herbert K. Hazel, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,033
Int. Cl. B23k *1/06, 9/12, 11/10*
U.S. Cl. 219—80 15 Claims



Apparatus for automatically bonding wires to spaced terminals has forming means for moving the end of a length of wire into a bonding position with the end thereof presented between the jaws of a clamping and pulling means which clamps the wire end during a bonding and then pulls the wire to break off a portion thereof beyond the bond, the forming means being also used to determine the shape and height of staples between bonds. A stripper removes the insulation from the portion of wire to be bonded. For bonding paired wires simultaneously to a terminal pad and a ground grid, the apparatus includes a spreader which positions both wires accurately in bonding grooves of a bonding tip and a twister for twisting the paired wires between bonds.

3,646,308

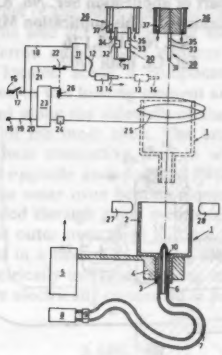
METHOD OF HEATING A HOLLOW ARTICLE

Raymond Francois Spiessens; Leffert Schuringa, and Ghislain Felix Alfons Arthur Verboven, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 2, 1970, Ser. No. 51,949
Claims priority, application Netherlands, July 9, 1969, 6910497
Int. Cl. H01j *1/90*
U.S. Cl. 219—121 P 10 Claims

The invention relates to a method of deforming a portion

of a hollow article with the aid of a plasma burner in such a

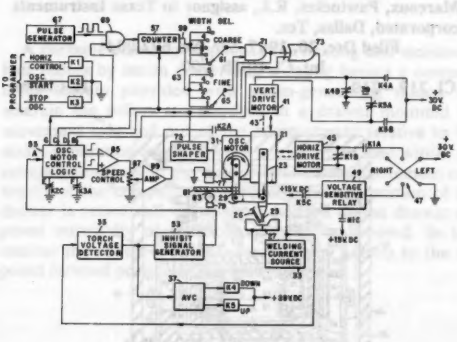


manner that the section between the inner and outer walls is completely heated above its softening point.

3,646,309
SELF-ADAPTIVE WELDING TORCH CONTROLLER

Carl M. Smith, Jr., Knoxville, and William R. Miller, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 26, 1971, Ser. No. 109,867
Int. Cl. B23k 9/12
U.S. Cl. 219—125 PL 8 Claims

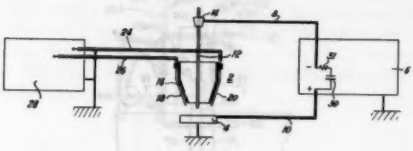


A fully automatic, self-adaptive welding system has been provided for programmed welding applications. The welding torch position, either vertically or horizontally, is generally responsive to a signal proportional to the work-to-torch spacing as well as certain other signals including pulses used to control the oscillation of the torch across the weld area. Control of the torch oscillation is, in part, supplied by the spacing signal. Use of the system ensures welds of high quality as to weld tie-in, conformity to vertical or horizontal irregularities in the parts, and thickness.

3,646,310
HIGH-FREQUENCY STARTING DEVICE FOR AN ELECTRIC WELDING ARC

Jean Manethou, Montsoult, France, assignor to L'Air Liquide Societe Anonyme Pour E'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed June 22, 1970, Ser. No. 47,970
Int. Cl. B23k 9/10
U.S. Cl. 219—135 4 Claims

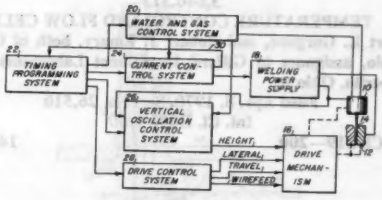


A device for starting an electric arc welding torch. To the nozzle of the torch are attached two auxiliary electrodes energized by a high-frequency electric current generator through coaxial cables. There is no electric connection between the welding electrode and the auxiliary electrodes.

3,646,311
METHOD AND APPARATUS FOR VERTICAL TORCH OSCILLATION INVERSELY TO CURRENT MAGNITUDE

James A. Cameron, Niantic; Joseph Lanzafame, Gales Ferry, both of Conn., and Leonard E. Mann, Woodridge, Ill., assignors to General Dynamics Corporation, New York, N.Y.

Filed Oct. 29, 1968, Ser. No. 804,332
Int. Cl. B23k 9/00
U.S. Cl. 219—137 4 Claims



A process and system for welding of the tungsten inert gas (TIG) type is described. A welding torch is mounted on a mechanism which provides for motion of the torch with respect to the work (a pipe being welded) in three different directions. Movement in each direction is electronically controlled so as to obtain preset magnitudes of oscillation of the torch, both vertically and laterally with respect to the work. The vertical oscillation is provided by following the pulsating arc current in accordance with a preselected control function. In addition, the system and process provides for control of substantially all of the parameters affecting the formation of the weld in order to produce improved weldments.

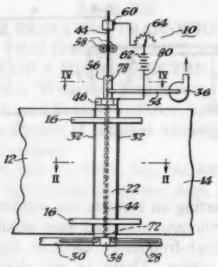
3,646,312
ELECTRODES FOR WELDING AND THE LIKE

Harold Edward Cable, Thornburg, and Herbert Edward Cable, Pittsburgh, both of Pa., assignors to Weld Tooling Corporation, Pittsburgh, Pa.

Original application Nov. 21, 1971, Ser. No. 684,845, now Patent No. 3,535,490, dated Oct. 20, 1970. Divided and this application Sept. 1, 1970, Ser. No. 68,733
Int. Cl. B23k 35/22
U.S. Cl. 219—146 3 Claims

Welding electrodes are disclosed including an elongated ribbon or strip coated with insulating and fluxing material for

close-fitting insertion in a gap between conductive plates or other shapes to be welded. The width of the electrode strip is substantially the same as the thickness of the members to be joined, while the thickness of the electrode is substantially equal to the width of the gap so that the gap is substantially filled when the electrode is inserted endwise through the gap. Very little electrode length need be subsequently inserted into the gap as welding proceeds to compensate for flux coat-



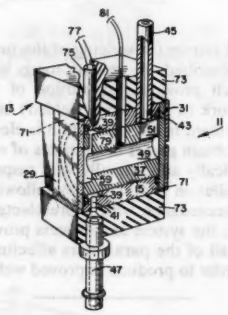
ing displacement and gap clearances. The electrode is coated with a glasslike or ceramic fluxing material having (e.g. for welding steel) a melting point above 900° F. The coating is a strong dielectric at lower temperatures but exhibits fluxing characteristics when molten at higher temperatures. The dielectric flux can be applied by dipping, spraying or painting, or by applying a sleeve of woven, matted or wrapped glass or glasslike fibers.

3,646,313

TEMPERATURE CONTROLLED FLOW CELL

Robert L. Gorgone, and Robert J. Emary, both of Oberlin, Ohio, assignors to Gilford Instrument Laboratories Inc., Oberlin, Ohio

Filed Apr. 8, 1970, Ser. No. 26,510
Int. Cl. H05b *1/00*
U.S. Cl. 219—200 **14 Claims**



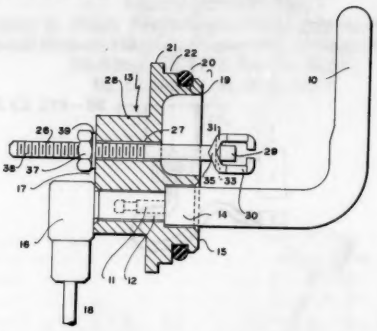
A fluid sample flow cell is constructed with a thermistor junction intimately positioned next to the sample analysis chamber which is in a cell block that has high-thermal conductivity and is provided with electrical heating elements. Electronic controls coupled to the thermistor junction and heating elements enable the fluid sample to be maintained at a precisely regulated temperature.

3,646,314

ELECTRIC ENGINE COOLING JACKET HEATER

Lynne E. Windsor, 251 Beaverbrook St., Winnipeg, Manitoba, Canada

Continuation-in-part of application Ser. No. 833,650, June 16, 1969, now abandoned. This application Mar. 15, 1971, Ser. No. 124,176
Int. Cl. B60l *1/02*
U.S. Cl. 219—208 **1 Claim**



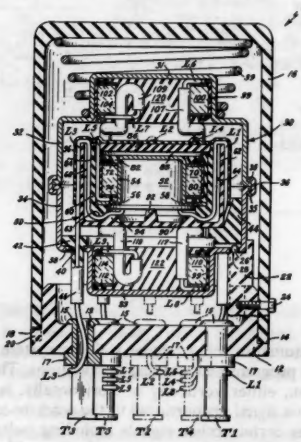
A block heater having a substantially cylindrical adapter plate with a sealing ring enabling same to be engaged within a frost plug aperture. A swivelable bridging member is secured to the end of a capscrew extending through the adapter plate so that the bridging piece can be tilted when the adapter plate is being inserted and then assumes a position parallel to the adapter plate when the capscrew is tightened thus clamping the heater into the frost plug aperture. The screw is long enough to permit the nut to be "-backed off" so that axial and rotational movement of the screw and bridging member will enable the heater to be positioned properly in the frost plug aperture.

3,646,315

SELF-REGULATED HEATING DEVICE

Leo Marcoux, Pawtucket, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1967, Ser. No. 692,004
Int. Cl. H05b *1/00*
U.S. Cl. 219—210 **10 Claims**



Apparatus for providing a relatively constant ambient for temperature sensitive devices in which an inner oven, adapted to hold such devices, containing a heating element

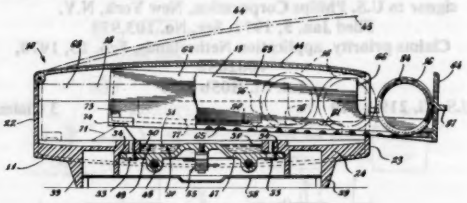
formed of material having a steep-sloped positive temperature coefficient of resistance (hereinafter referred to as PTC) above a threshold or anomaly temperature is placed within an outer oven containing at least one heating element formed of PTC material having a lower threshold or anomaly temperature than that of the inner oven's heating element. These heating elements also act as their own temperature regulators. The preferred embodiment employs a single toroidal PTC element located about a component mounting can. Leads connected to this heating element and the component leads are guided along the sidewalls of the electrically insulating housing of the inner oven. The entire inner oven is mounted in a heat conductive shell in which are fitted in recesses at two opposite ends toroidal PTC elements. Leads connected to the outer oven heating elements and the other leads are threaded through guide members placed in aligned apertures in the outer oven shell and are connected to terminals mounted in a base. The heating elements are locked in place by electrically insulating potting material. The heating elements are electrically connected in parallel.

3,646,316

PORTABLE ELECTRIC APPLIANCE FOR STEAMING HAIR ROLLERS

Michael J. Volosin, Bridgeport, and Theodore R. Flowers, Fairfield, both, Conn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 41,943
Int. Cl. A45d *4/16*; H05b *1/00*
U.S. Cl. 219—222 **13 Claims**



A portable electrical appliance for heating and moistening hair rollers by steam comprising a casing having a compartment therein provided with steam-generating means and wherein the rollers are disposed in a drawer mounted for movement into and out of the compartment relative to the steam-generating means. Means are also provided within the compartment to stop the drawer after partial movement outwardly of the compartment whereby the rear portion of the drawer is raised and the forward portion of the drawer exposed outwardly of the compartment, is lowered. In this manner the rollers are fed sequentially by gravity to the exposed forward portion of the drawer for use.

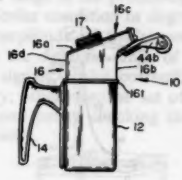
3,646,317

HAND STEAMING DEVICE

Leonard Osrow, Great Neck, N.Y., assignor to Osrow Products Company, Inc., Glen Cove, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,215
Int. Cl. F22b *1/30*
U.S. Cl. 219—271 **27 Claims**

A hand steaming device including a reservoir casing having a cover attached thereto. Located on the cover is steam discharge means and water intake means with the water intake means adapted to receive water which can flow through the cover to the reservoir casing. An electrode casing in which steam is produced is secured to the cover and includes a restricted steam discharge opening and means is provided for guiding the steam produced in the electrode casing through the restricted discharge opening to the steam discharge means. A pair of spaced-apart electrodes extend partially into the electrode casing and means is provided for allowing the water to flow from the reservoir casing to the electrode casing when the electrode casing restricted discharge opening is able to discharge steam as rapidly as it is produced and for reversing this transfer when the electrode



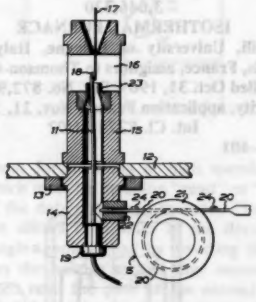
casing restricted steam discharge opening is not able to discharge steam as rapidly as it is produced. Means is provided for moving moisture trapped in the steam before it reaches the steam discharge means. The cover has accessory attaching means adjacent the steam discharge means to which can be attached a brush or a roller accessory.

3,646,318

APPARATUS FOR CONTROLLING THE TEMPERATURE OF A SAMPLE DURING THE EXAMINATION THEREOF

Karl-Axel Melin, Asarum, Sweden, assignor to Incentive Research & Development AB, Bromma, Sweden

Filed May 27, 1969, Ser. No. 828,299
Claims priority, application Sweden, May 29, 1968, 7214/68
Int. Cl. H05b *3/40*
U.S. Cl. 219—300 **2 Claims**



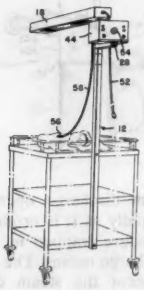
A sample during its examination in the chamber of an X-ray diffraction camera comprising a chamber body mounted in the X-ray diffraction camera to traverse the X-ray axis in the camera, a passage extending through the chamber body coaxially with the X-ray axis of the camera, a nozzle in the chamber body discharging into the passage between the ends thereof and transversely of the X-ray axis of the camera, a bore in the chamber body merging and sample into the passage with the sample to be held in the X-ray axis of the camera and in front of the nozzle, a source of pressurized gas, a tube having an electrically conductive wall connected at one end to the source of gas and at the other end to the nozzle, current control means connected to the ends of the tube for feeding an electric current through the wall of the tube to heat the tube and the gas passing therethrough, and an electric temperature sensor mounted in the passage of the chamber body adjacent the X-ray axis of the camera and in front of the nozzle and being connected to the current control means for governing the magnitude of electric current through the wall of the tube. A gas cooler is connected in series between the source of pressurized gas and the tube.

3,646,319

INFANT WARMER HAVING ELECTRIC (INFRARED) HEATING MEANS

John R. Auld, Eugene, Oreg., assignor to Merco Products, Inc., Eugene, Oreg.

Filed Dec. 9, 1968, Ser. No. 782,166
Int. Cl. H05b *1/02*
U.S. Cl. 219—347 1 Claim



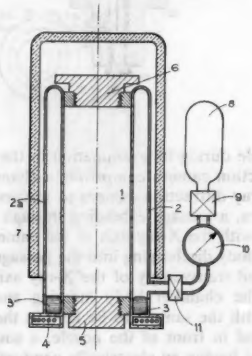
A separate environment limited to the immediate vicinity of an infant is created by the infant warmer which employs infrared radiation controlled in intensity by a unit responsive to the body skin temperature of an infant. The warmer is elongate in design to provide a controlled environment of limited dimensions within a surrounding ambient environment and includes a vertical mounting stand which is adapted to receive insertable block adjusting sections for controlled height adjustment.

3,646,320

ISOTHERMAL FURNACE

Carlo Rosatelli, University of Bologne, Italy, and Arvind Shroff, Paris, France, assignors to Thomson-CSF

Filed Oct. 31, 1969, Ser. No. 872,940
Claims priority, application France, Nov. 21, 1968, 174757
Int. Cl. F27d *11/02*
U.S. Cl. 219—401 4 Claims



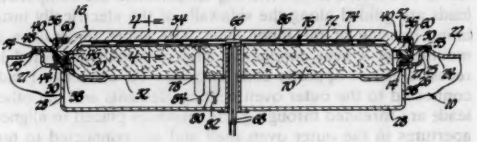
A furnace providing an isothermal heating all along its height comprising a liquid which is heated for filling an envelope surrounding the volume to be heated with the vapor of this liquid and a system for filling the upper part of this envelope with a gas, not mixing with this vapor, for varying the operating height of the furnace.

3,646,321

INFRARED SURFACE HEATING UNIT

Donald C. Siegla, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 22, 1970, Ser. No. 48,389
Int. Cl. H05b *3/68*
U.S. Cl. 219—464 5 Claims



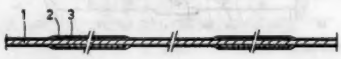
An infrared surface heating unit including an upper utensil supporting infrared transmissive cover plate having a convolute-shaped ribbon resistance element contiguous with the undersurface of the cover plate. The element has corrugations formed across its width throughout its length such that a blend of conductive and radiant heating of the utensil is achieved.

3,646,322

ELECTRIC RESISTANCE HEATING CABLE

Bernardus Willebrordus Speekman, Venlo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1971, Ser. No. 103,978
Claims priority, application Netherlands, Feb. 13, 1970, 7002052
Int. Cl. H05b *3/34*
U.S. Cl. 219—549 3 Claims



An electric resistance heating cable having alternating sectors of different temperature during use obtained by winding a heating wire having sectors of comparatively high- and comparatively low-electric resistances on a core of an electrically insulating material and by enveloping the assembly with an electrically insulating covering.

3,646,323

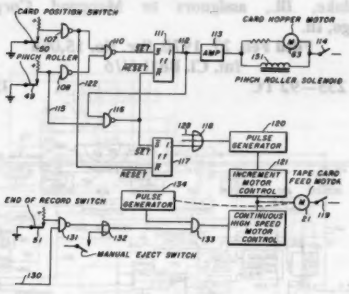
MAGNETIC CARD READER-RECORDER

Virgil F. Young, 1123 Elsah Ave., North Whittier, Calif., and Amable A. Pebenito, 6861 West 85th Pl., Los Angeles, Calif.

Original application Jan. 13, 1969, Ser. No. 790,632. Divided and this application July 2, 1970, Ser. No. 60,956
Int. Cl. G06k *7/08*
U.S. Cl. 235—61.11 D 2 Claims

A combined reader and recorder for both magnetic tape and magnetic cards wherein the tape and cards may be advanced in either direction during reading or recording. The apparatus comprises two spaced feed rollers extending across a card guideway and driven in either of opposite directions. Pinch rollers for holding the cards against respective feed rollers extend over one portion only of the guideway and other pinch rollers are carried by a magnetic tape magazine for guiding the tape along another portion of the rollers. A pres-

sure pad for maintaining the cards in intimate contact with the transducer head is movable out of the way when the magnetic tape magazine is to be placed in position to process the tape.

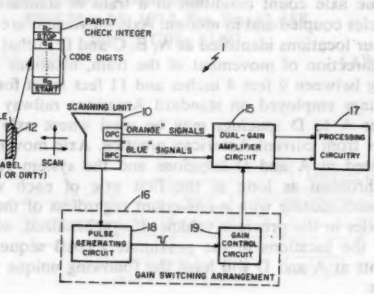


3,646,324

INFORMATION-PROCESSING SYSTEM

Frank G. Macey, Shrewsbury, Mass., assignor to GTE Sylvania Incorporated

Filed Nov. 10, 1970, Ser. No. 88,318
Int. Cl. G06k 7/10
U.S. Cl. 235—61.11 E **20 Claims**



An optical label-reading system for reading coded retroreflective labels affixed to railway vehicles. The labels may be clean, that is, have little or no foreign matter (e.g., ore dust or dirt) thereon, or dirty, that is have a significant amount of foreign matter thereon. In accordance with the invention, each label, whether clean or dirty, is scanned twice by a scanning unit whereby two sets of identical signals representative of the information encoded in the label are produced in succession by the scanning unit. The two sets of signals are applied in succession to a dual-gain amplifier circuit. The dual-gain amplifier circuit has two values of gain, a first value corresponding to a "clean-label" condition and a second, larger value corresponding to a "dirty-label" condition, and is adapted to be switched alternately between its two values of gain during successive scanning operations. The two values of gain are selected such that signals derived from a clean label and amplified by the first value of gain, or signals derived from a dirty label and amplified by the second value of gain, have a resulting amplitude which is within the dynamic range of processing circuitry employed to process the amplified signals produced by the dual-gain amplifier circuit.

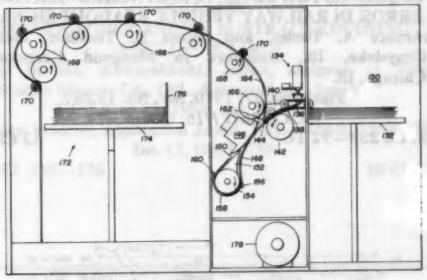
Each of the two identical successive sets of signals derived from a label, whether clean or dirty, is amplified by a different one of the two values of gain thereby causing two sets of amplified output signals to be produced in succession by the dual-gain amplifier circuit. One of the two sets of amplified signals, by virtue of the values of gain selected for the dual-gain amplifier circuit, clearly has an amplitude falling within the dynamic range of the processing circuitry and is correctly processed by the processing circuitry. The other set of amplified signals may or may not have an amplitude falling within the dynamic range of the processing circuitry as determined by the particular condition or degree of cleanliness of the label. If the amplitude of the second set of amplified signals falls within the dynamic range of the processing circuitry, this set of signals is also correctly processed by the processing circuitry; otherwise, the set of signals is rejected by logic circuitry and parity checking circuitry provided in the processing circuitry.

3,646,325

DOCUMENT READER FOR READING DATA ON BOTH SIDES OF A DOCUMENT

Richard Willis George, Iowa City, Iowa, assignor to Westinghouse Learning Corporation

Filed Nov. 21, 1969, Ser. No. 878,739
Int. Cl. B41f 5/02; G06k 7/14; G01n 21/30; G06k 13/07; G01d 15/28
U.S. Cl. 235—61.11 R **5 Claims**



An arrangement for handling at high speeds documents both sides of which must be machine "read" or "scanned" in order to record the data contained thereon. The mechanism of the invention allows both sides of the document to be scanned by a single reading head by inverting the document and passing it by the head a second time immediately after one side has been read the path of the second passing not crossing the path followed by the document for the first reading.

3,646,326

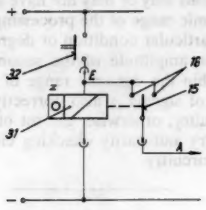
ERROR DETECTING PULSE COUNTER

Josef Gruler, Aixheim; Bruno Borgonovi, Trossingen; Ernst Friedrich Henning Streitberger, and Kurt Wilhelm Kratt, both of Aldingen, all of Germany, assignors to J. Hengstler K.G., Aldingen Kreis Tuttlingen, Germany

Filed Feb. 25, 1970, Ser. No. 13,963
Claims priority, application Germany, Mar. 1, 1969, P 19 10 456.4
Int. Cl. H03k 21/34
U.S. Cl. 235—92 EC **21 Claims**

Mechanical counter drivers are adapted to receive counting pulses and to perform a counterdriving operation in response to each of said counting pulses. Input signal generators are coupled to said counter drivers and arranged to be shifted between two positions in response to each of said counterdriving operations. Output signal generators are arranged to be shifted between two positions in response to each of said counting pulses. Said positions assumed by said

input and output signal generators have normally a predetermined relation. An error signal generator is adapted to compare the positions of said input and output signal generators



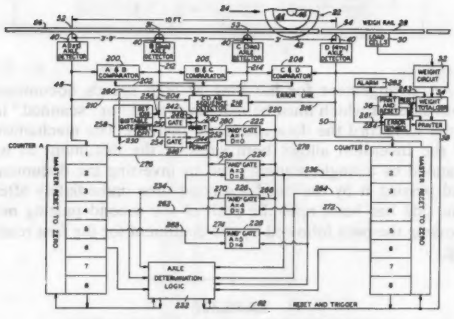
and to generate an error signal when said positions of said input and output signal generators have another than said predetermined relation.

3,646,327

METHOD AND APPARATUS UTILIZING UNIQUE CDAB SEQUENCE FOR DETECTING SYNCHRONIZATION ERROR IN RAILWAY VEHICLE READOUT SIGNAL

Lawrence A. Tonies, and James R. Teasdale, both of Grayslake, Ill., assignors to Mangood Corporation, Chicago, Ill.

Filed Feb. 27, 1970, Ser. No. 15,067
Int. Cl. B61l 1/16; G06m 3/14
U.S. Cl. 235—92 TC **12 Claims**



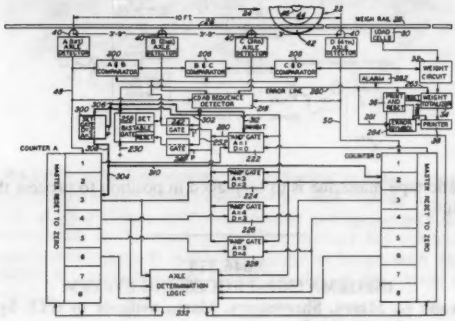
Method and apparatus for detecting synchronism error in a system which activates a readout signal for each vehicle in a train having a mixture of standard four-, six- and eight-axle cars and engines while coupled and in motion. Four axle detectors identified A, B, C and D are arranged in that order along the line of movement of the train. With the A and D detectors spaced 9 feet 4 inches to 11 feet apart, and the B and C detectors approximately evenly spaced between them, they will be actuated in a unique CDAB sequence once per standard, American four-, six- or eight-axle railway vehicle. A synchronism error signal will be activated unless one of four specific combinations of A and D axle detector actuations have occurred when the unique, CDAB sequence occurs.

3,646,328

METHOD AND APPARATUS UTILIZING UNIQUE CDAB SEQUENCE FOR CORRECTING SYNCHRONIZATION ERROR IN RAILWAY VEHICLE READOUT SIGNAL

Lawrence A. Tonies, and James R. Teasdale, both of Grayslake, Ill., assignors to Mangood Corporation, Chicago, Ill.

Filed Feb. 27, 1970, Ser. No. 15,068
Int. Cl. B61l 1/16
U.S. Cl. 235—92 TC **15 Claims**



Method and apparatus for correcting synchronization error in a system for synchronizing a readout signal with some unique axle count condition in a train of standard railway vehicles coupled and in motion. Axle movement are detected at four locations identified as A, B, C and D in that order, in the direction of movement of the train, locations A and D being between 9 feet 4 inches and 11 feet apart for the axle spacings employed on standard American railway vehicles. Other A to D spacings may be used where axle spacings differ from current American practice. Axle movements are counted at A and D locations and the system remains in synchronism as long as the first axle of each vehicle is counted starting with a one-count regardless of the number of axles in the previous vehicle. If synchronized, when axles pass the locations in the proximate CDAB sequence, axle counts at A and D will have the following unique combinations:

A=3, D=2 for four-axle vehicles;
A=4, D=3 for six-axle vehicles;
A= 5, D=4 for eight-axle vehicles; and
A=1, D=0 for uncoupled and certain long-coupled vehicles.

If out of synchronism, the system is resynchronized according to the present invention by detecting the unique CDAB sequence and repeatedly, if necessary, setting the A and D counts to one of the above unique combinations until a vehicle identified by such combination moves past the detector locations.

3,646,329

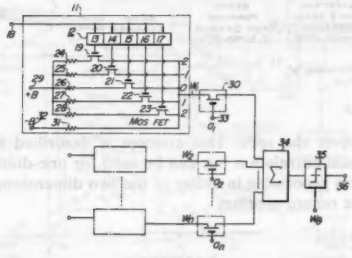
ADAPTIVE LOGIC CIRCUIT

Hirokazu Yoshino, and Tomio Yoshida, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 13, 1969, Ser. No. 876,269
Claims priority, application Japan, Nov. 20, 1968, 43/85735
Int. Cl. G05b 13/02
U.S. Cl. 235—150.1 **3 Claims**

An adaptive logic circuit which is a basic component circuit of a learning machine. A voltage divider comprising a variety of parallel resistances and a common resistance connected in series thereto gives weighting constants one of which is to be selected by applying outputs of respective stages of a shift register to the gates of MOS field effect transistors connected between the respective resistances and

the common resistance. The MOS field effect transistor whose control terminal is supplied with an input signal becomes conductive thereby providing a threshold function.



This circuit can be formed entirely of solid state elements, enabling the electronic setting of weights so that the learning processes can be performed at very high speed.

3,646,330

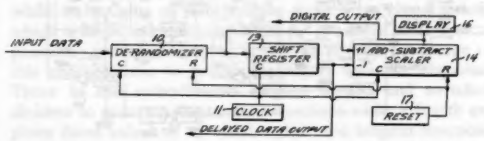
CONTINUOUS DIGITAL RATEMETER

Stanley J. Rudnick, Naperville; Paul L. Michaud, Lockport, and Karl G. Porges, Evanston, all of Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 28, 1970, Ser. No. 41,457

Int. Cl. G01r *23/02*

U.S. Cl. 235—150.3 **6 Claims**



A continuous ratemeter having a digital output is described. The ratemeter has relatively long integration periods while producing a substantially continuous output. The ratemeter develops a delayed replica of the input pulse train and can indicate differential as well as integral count rates.

3,646,331

AUTOMATIC 100% LINE ADJUSTMENT OF SPECTROPHOTOMETERS

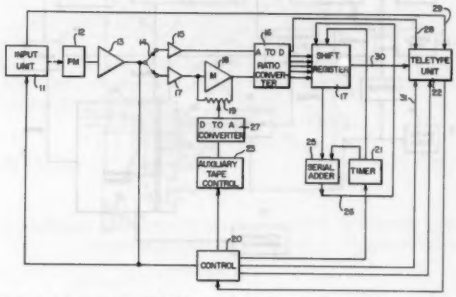
Joseph Samuel Lord, Walpole, Mass., assignor to Kollmorgen Corporation, New York, N.Y.

Filed Sept. 3, 1970, Ser. No. 69,333

Int. Cl. G06j *1/00*; G01j *3/00*

U.S. Cl. 235—151.3 **12 Claims**

A method and apparatus for correcting radiation measuring errors in a spectrophotometer by digitizing the output of a 100-percent line input at selected discrete wavelengths. Each of the digitized values represent the spectrophotometer response at a particular wavelength. A factor, called an M factor is computed from the output at each discrete wavelength such that the digitized output multiplied by the M factor will give a corrected 100-percent output at each wavelength. These factors are each stored, and then when a sample is measured by the spectrophotometer, each of the stored M factors are synchronously applied to multiply the input signal derived from the sample thereby generating a corrected output.



3,646,332

BINARY ADDER AND/OR SUBTRACTION USING EXCLUSIVE LOGIC

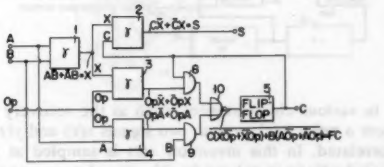
Yasoji Suzuki, Kawasaki-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 27, 1969, Ser. No. 837,240

Claims priority, application Japan, July 3, 1968, 43/46035

Int. Cl. G06f *6/50*

U.S. Cl. 235—176 **10 Claims**



A logical operation circuit device includes a number of exclusive AND/OR logical elements derived from the logical formulas associated with a full added/subtractor. The arrangement provides a full adder/subtractor for operating on one-bit binary digital signals.

3,646,333

DIGITAL CORRELATOR AND INTEGRATOR

Cabell N. Pryor, Jr., Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

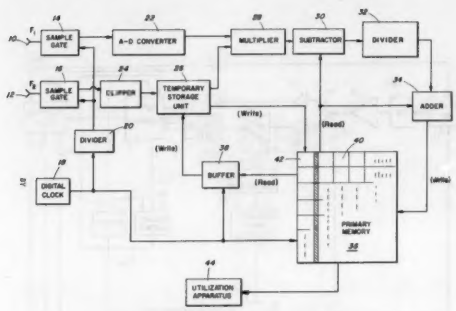
Filed Dec. 12, 1969, Ser. No. 884,392

Int. Cl. G06g *7/19*

U.S. Cl. 235—181 **4 Claims**

A digital correlator and integrator which uses a core memory to implement the cross-correlation and post-integration operations simultaneously. The system is a hybrid correlator that treats one of two sample channels linearly while it delays and stores the information in the other channel. The

samples from both channels are multiplied together then averaged repetitively into stored data to generate a time-compressed correlation function which is retained in digital form within the memory.

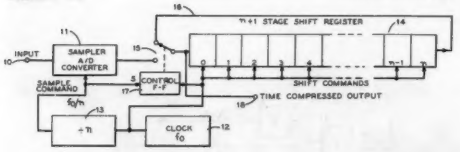


3,646,334

REAL-TIME CORRELATOR

Ivar Wold, Farnborough, Hampshire, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed May 27, 1970, Ser. No. 40,987
Claims priority, application Great Britain, May 28, 1969, 27,044/69
Int. Cl. G06f *15/34, 7/04*
U.S. Cl. 235—181 **5 Claims**



In various circumstances, such as the recovery of a signal from a noisy background, two signals $x(t)$ and $y(t)$ are to be correlated. In this invention $x(t)$ is sampled at recurrence period n/f_0 (n is at least 2). The samples are put into a recirculating memory of circulation time $(n+1)/f$ with erasure of existing samples at point of insertion. The memory is coupled to a multiplier which multiplies the output of the memory with synchronized samples of $y(t)$. The output of the multiplier is applied to an averaging memory. Only one multiplier is used to give the correlation function at n different time delays and hence greatly simplified apparatus is provided.

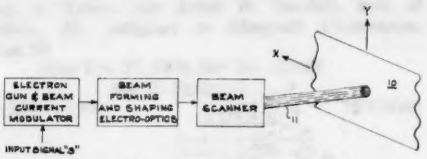
3,646,335

RECORDER CORRELATOR USING SCANNING RECORDER DEVICES

Ivan Cindrich, Southfield, Mich., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 11, 1969, Ser. No. 798,357
Int. Cl. G06g *7/19, 9/00*
U.S. Cl. 235—181 **7 Claims**

A technique for simultaneously generating and recording a correlation function by utilizing an intensity modulated beam of light or electrons directed onto a record medium in a scanning format is described and several methods of implementation are given. As the beam scans across any selected spot on the record medium, the correlation function appears in the form of record medium exposure in accordance with the temporal and spatial variations of the beam during its passage over the spot. This concept is described for two-dimensional correlation but can be used for one-dimensional correlation processing in either of the two dimensions available on the record medium.

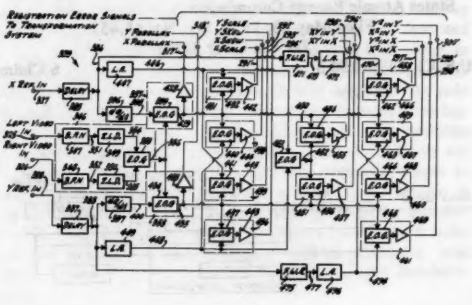


3,646,336

CORRELATION UNIT

Gilbert L. Hobrough, Los Altos, Calif., assignor to Itek Corporation, Lexington, Mass.

Original application Sept. 4, 1964, Ser. No. 394,502, now Patent No. 3,432,674. Divided and this application Sept. 30, 1968, Ser. No. 822,085
Int. Cl. G06g *7/19;* **H03d** *13/00*
U.S. Cl. 235—181 **12 Claims**



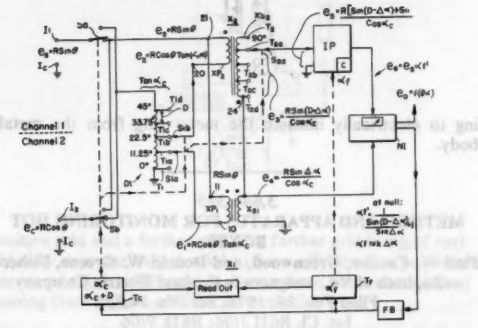
A photogrammetric system for automatically registering a pair of photographic images for stereographic inspection. Automatic registration of the photographic images is accomplished by electronically sensing parallaxes between the images, and by transforming the images to accomplish registration. Each of a pair of stereo photographs is scanned in X and Y by a separate flying spot scanner which is driven by X- and Y-raster generators. The output of the flying spot scanners is applied to a separate video processor for controlling and enhancing the image signals and then to a separate cathode-ray tube which is driven in X and Y by the same X- and Y-raster generators. The two cathode-ray tubes comprise the left and right sides of a binocular viewer. The output of each of the flying spot scanners and the X- and Y-raster signals are applied to a correlation system which detects parallax errors and first and second order distortions between corresponding sections of each of the photographic images. The correlation system divides the output signals of the flying spot scanners into different frequency band-pass regions for separate correlation of the components of each of the signals in each band-pass region. The output of the correlation system is applied, via a transformation system, as correction signals to the raster signals driving the flying spot scanners which enables the pair of photographic images to be viewed in registration.

3,646,337

APPARATUS FOR PROCESSING ANGULAR DATA

Harry P. Bifulco, Jr., Huntington, N.Y., assignor to North Atlantic Industries Inc., Plainview, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,879
Int. Cl. G06g 7/22
U.S. Cl. 235—186 64 Claims



Resolver apparatus is disclosed employing a system which receives resolver inputs $R\sin\theta$ and $R\cos\theta$ and is adjusted according to coarse and fine processor angles α_c and α_f to achieve a measurement of, or facilitate operations on, the resolver input angle θ. The apparatus employs two computing channels, one for each resolver input, a function generator circuit for developing tangent (or cotangent) functions of α_c, a linear interpolator in one of the channels, and circuits interconnecting the channels so that the signals ultimately developed in the channels bear a relationship which permits one of them to be linearly interpolated as a function of α_f while maintaining an interpolating angle error characteristic which is small and independent of α_c. A simple passive compensating technique may be employed to take advantage of this characteristic to produce a highly accurate response. Three of the embodiments employ tapped and switched dividers to generate the tangent functions while a fourth exploits those values of α_c which reduce the tangent functions to zero of unity, thereby permitting the use of simple combining circuits for function generation.

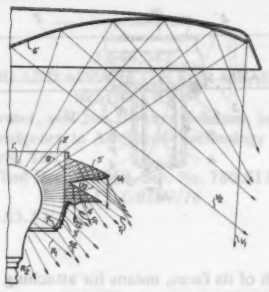
3,646,338

LIGHTING FITTING

Ignacio Goytisolo Taltavull, Lalle Madrazo, No. 83, Barcelona, Spain

Filed July 24, 1969, Ser. No. 844,376
Claims priority, application Great Britain, July 31, 1968, 36,635/68
Int. Cl. F21p 1/00
U.S. Cl. 240—3 5 Claims

A lighting fitting for an electric luminous source having a molded part of transparent material surrounding the luminous source. The molded part is open on the top and at the bottom and has a first lower system of outer prisms and a second upper system of two outer prisms, all of them located in planes normal to the symmetry axis of the luminous source. A top part offers the luminous source a concave reflecting surface. The assembly is arranged so that a part of the luminous rays emerge directly through the lower opening of the molded part, another part is refracted by the first system of prisms, another part undergoes a total reflection in the second system of prisms, emerging out of the first prism of this second system in a diver form and of the second prism in a convergent form without hitting the lower located prisms, and part of the light rays is reflected downwards and outwards by the upper reflecting surface. The molded part may comprise another system of inner prisms disposed in



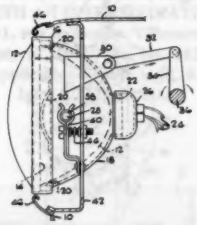
planes which pass through the symmetry axis and direct the light rays in an asymmetric form relative to the ground's plane.

3,646,339

PIVOTING DEVICES ALLOWING CONTINUOUS AUTOMATIC HEADLAMP ADJUSTING

Gideon Petrus Schoeman Yssel, "Sanitas," Noordbrug, Transvaal Province, Republic of South Africa

Filed June 24, 1969, Ser. No. 835,938
Int. Cl. B60q 1/10
U.S. Cl. 240—7.1 R 3 Claims



A headlamp pivotally mounted about a transverse and horizontal axis on a resiliently suspended vehicle body for tilting movement relative to the relative movement of sprung and unsprung parts of the vehicle and having axially aligned parts engaging journals while with the journals axially directed compression springs are associated to take up slack or play. The invention also extends to incorporating a pivotal mounting in a member which applies controlled tilting movement to the headlamp. Furthermore the invention extends to the mounting of journals in spring clip devices with which lateral adjusting elements are associated.

3,646,340

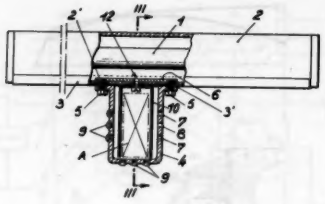
DISCHARGE TUBE ASSEMBLY

Marie Henri Hubert Adam, Le Moulin, Larey par Bayon, Meurthe et Moselle, France

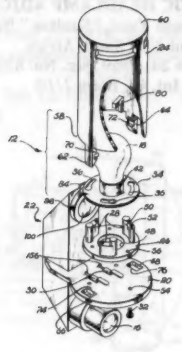
Filed Oct. 3, 1969, Ser. No. 863,494
Int. Cl. F21l 0/00; H05b 33/02
U.S. Cl. 240—11.4 N 3 Claims

The present invention relates to a luminous element with variable points of attachment, in which the attachment organ

is constituted by a removable lateral extension which can be attached at any point on the length of said element, and comprises, on each of its faces, means for attaching the whole on a suitable support in any geometric arrangement.



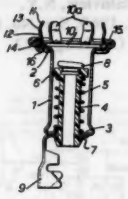
3,646,341
HEADLAMP
Morris Klatskin, 11810 National Blvd., Los Angeles, Calif.
Filed June 10, 1970, Ser. No. 45,080
Int. Cl. A61b *1/06*
U.S. Cl. 240—59 **10 Claims**



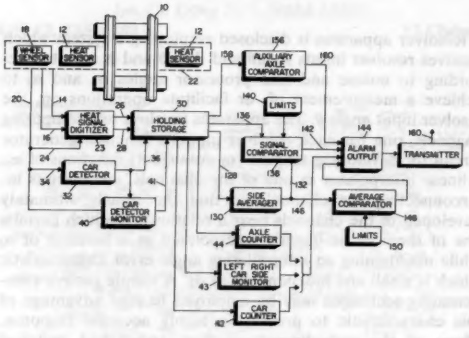
A headlamp which can be worn by a surgeon for projecting a beam of light from a point between his eyes. A periscopic mirror and lens arrangement is utilized to direct light from a prefocused bulb to a projection lens which is articulated on a generally vertical plane between the wearer's eyes. A headband of novel construction is provided in which overlapping ends of a strip of resilient material are spring loaded to girdle the wearer's head. The lamp is adjustably connected by a ball joint to a pair of links which are pivotally carried at their rear ends in a slotted bracket attached to the headband.

3,646,342
LAMPHOLDER
John Arthur Howe, 5 Allison Gardens, Chilwell, and Brian Darkins, 53 Gibbons Ave., Stapleford, both of England
Filed Aug. 20, 1970, Ser. No. 65,556
Claims priority, application Great Britain, Aug. 25, 1969, 42,273/69
Int. Cl. F21v *17/00*; H02b *1/02*
U.S. Cl. 240—152 **2 Claims**

This invention comprises a lampholder including a hollow metal body defining a lamp base receiving cavity having a metal attaching ring secured to the open end by a one-piece molding of synthetic plastics secured to a flange on the body and the base of the attaching ring, the plastics molding serving to electrically insulate the metal ring from the metal body.



3,646,343
METHOD AND APPARATUS FOR MONITORING HOT BOXES
Paul W. Caulier, Greenwood, and Donald W. Greene, Fishersville, both of Va., assignors to General Electric Company
Filed Feb. 26, 1970, Ser. No. 14,574
Int. Cl. B61l *3/06*; B61k *9/06*
U.S. Cl. 246—169 D **20 Claims**



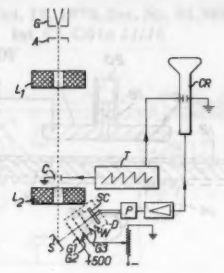
The temperatures of a plurality of journal bearings or boxes on a passing car are monitored. An average temperature value for each side of the passing car is derived. Comparisons are then effected between the temperatures of the individual journal boxes disposed on a given side of the car and the derived average temperature value for the given side, and deviations above or below predetermined limits are utilized to signify the presence of an alarm condition.

Also, means is disclosed by which the presence of an alarm condition can be correlated to a particular car and wheel of the passing train. This information is then enunciated to the train crew so that defective conditions can be readily corrected.

3,646,344
SCANNING ELECTRON BEAM APPARATUS FOR VIEWING POTENTIAL DISTRIBUTION ON SPECIMEN SURFACES
Graham Plows, 80, Brent Court, Stevenage, Hertfordshire, and William Charles Nixon, 2, Causewayside, Fen Causeway, Cambridge, both of England
Filed Dec. 31, 1969, Ser. No. 889,762
Claims priority, application Great Britain, June 2, 1969, 300/69
Int. Cl. H01j *37/28*
U.S. Cl. 250—49.5 A **6 Claims**

In electron beam apparatus, in which a finely focused probe is caused to impinge on the surface of a specimen and

the resulting secondary electrons are collected and used to show potential distribution on the specimen surface the detector includes, between the collector and the specimen, a

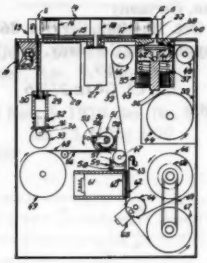


positive grid and a further grid, this further grid being of variable low or negative potential to form effectively a potential barrier of adjustable height to discriminate between electrons coming from regions of different potential.

3,646,345
DIRECT INTERACTION DETERMINATION OF PRIMARY PRODUCTIVITY

Chris J. Plakas, 3645 Bangor St, S.E. Washington, D.C., and Rosemary Fry, 3223 Cleveland Ave, Kansas City, Kans.

Filed June 22, 1970, Ser. No. 48,181
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R **2 Claims**



Apparatus for measuring the primary productivity in situ of an aquatic sample by detecting scintillation fluorescence through surface contact of a scintillator and metabolized organisms carrying labeled carbon fixed photosynthetically therein, comprising a photosynthesis chamber where sample and labeled carbon are introduced for photosynthetic fixation, a filter tape for filtering the metabolized organisms, a scintillator tape and photomultiplier detector means for converting energy of beta particles to fluorescence and then to electrical pulses that are directly proportional to the amount of labeled carbon fixed by the organisms, a recorder for recording the output data and logic circuitry for programming the sequence of operation, thus accurately determining the primary productivity per unit of biomass.

3,646,346
ANTIBODY-COATED TUBE SYSTEM FOR RADIOIMMUNOASSAY

Kevin J. Catt, Melbourne, Australia, assignor to Pharmacia AB, Uppsala, Sweden

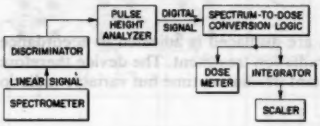
Filed Dec. 26, 1968, Ser. No. 786,959
Int. Cl. G01t 1/16
U.S. Cl. 250—83 **8 Claims**

A radioimmunological method and means for the determination of proteins in aqueous samples which includes adsorbing on the internal surface of a test tube of water-insoluble polymeric material the antibody against the protein to be determined. Suitable proteins which can be determined according to this method are plasma proteins, enzymes, and many hormones.

3,646,347
METHOD AND APPARATUS FOR MEASURING RADIATION

Bobby Joe Farmer, and Jim Howard Johnson, both of Arlington, Tex., assignors to Advanced Technology Center, Inc., Grand Prairie, Tex.

Filed Dec. 2, 1968, Ser. No. 780,511
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 R **19 Claims**

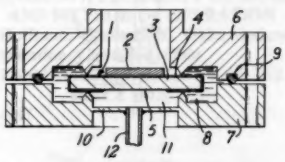


A method of measuring radiation dose in real time comprising the steps of measuring incident radiation with a spectrometer and weighting the radiation signal of the spectrometer with a pulse-height-to-dose conversion function.

3,646,348
NEUTRON-EMITTING TRITIATED TARGET HAVING A LAYER CONTAINING TRITIUM AND A PASSIVE SUPPORT WITH AN INTERMEDIATE BARRIER

Jacques Detaint, 121, rue de Bondy, Villemomble (93), France

Filed July 17, 1969, Ser. No. 842,626
Claims priority, application France, Aug. 8, 1968, 162318
Int. Cl. G21g 3/00
U.S. Cl. 250—84.5 **4 Claims**



A neutron-tritiated target, comprising a layer containing a suitable quantity of tritium and a passive support in which the layer is thick enough to retard deuterons bombarding the target and is applied to the support by way of a thin intermediate barrier, formed of a metal in which hydrogen isotopes diffuse slowly and having a thickness such as to prevent the return of the deuterons from the support to the layer at the same time as the passage of the tritium towards the support.

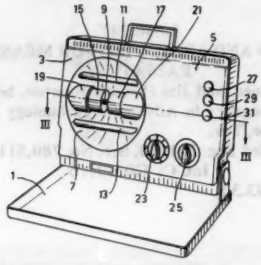
3,646,349
IRRADIATION DEVICE

Andreas Fredericus Rietveld, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y., assignor to Commissariot A L' Energie Atomique, Paris, France

Filed June 3, 1970, Ser. No. 43,156
Claims priority, application Netherlands, June 7, 1969, 6908713
Int. Cl. H01j 37/00
U.S. Cl. 250—86 **6 Claims**

An irradiation device having a source of UV radiation and two filter screens mounted for movement toward and away

from each other so as to fully or partly block the irradiation source. A time program device is provided so as to open and maintain the screen apart for a set period of time, which is constant for each irradiation period. The distance by which



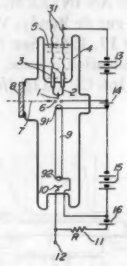
the screens are displaced is adjusted in accordance with the day of the radiation treatment. The device therefore operates with a constant irradiation time but variable radiation intensity.

3,646,350

LIGHT-DETECTING ELECTRON MULTIPLIER WITH FIELD EMISSION PHOTOCONDUCTIVE CATHODE

Haruo Maeda, Tokyo, and Jun Nishida, Machida-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 4, 1968, Ser. No. 773,078
Claims priority, application Japan, Nov. 10, 1967, 42/72728
Int. Cl. H01j *39/12*
U.S. Cl. 250—207 **1 Claim**



A light detector based on the fact that the field emission from a photoconductive material varies depending on a variation in the intensity of the light to which said photoconductive material is exposed, said detector comprising basically a field emission cathode of a photoconductive semiconductor in the form of a pointed whisker, and an electron collector for collecting the electrons emitted from said cathode, an appropriate accelerating voltage being applied between said cathode and said collector.

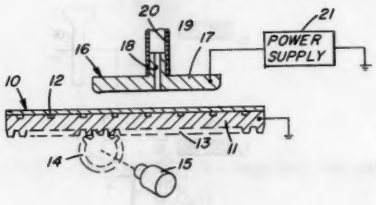
3,646,351

GAS-CUSHION CORONA CHARGER

James G. Jarvis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of application Ser. No. 823,067, May 8, 1969, now abandoned. This application Feb. 16, 1971, Ser. No. 115,726
Int. Cl. G03g *15/02*
U.S. Cl. 250—49.5 ZC **7 Claims**

A device for charging a xerographic or an electrostatic electrographic material by means of a cushion of flowing ionized gas. A supply of compressed air or other gas is applied to an aperture plate or a slotted tubular member for direction against a strip of material to be charged. The flow of gas is ionized by a source of potential connected between



the plate and a conductive backing plate in contact with the material. The ionized gas charges the material and at the same time maintains the material in spaced relation from the plate or tubular member and against the conductive backing plate with a uniform force.

3,646,352

METHOD OF MEASURING THE CONCENTRATION AND/OR SIZE OF SUSPENDED PARTICLES BY FORWARD SCATTERING OF LIGHT

Jan Bol, Kelkheim; Werner Heinze; Josef Gebhardt, both of Frankfurt, and Werner Letschert, Oberstedten, all of Germany, assignors to Bundesminister fur Wissenshaftliche Forschung, Bonn, Germany

Filed Oct. 10, 1969, Ser. No. 865,404
Claims priority, application Germany, Oct. 10, 1968, P 18 02 269.0
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **7 Claims**

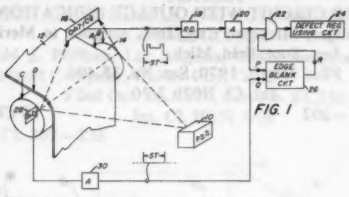
A method for measuring the concentration and/or size of illuminated particles suspended in a gas by means of the scattered light process. The suspended particles are illuminated by passing them through a focused laser beam in the vicinity of its focal plane. The light that is scattered from the particles in the direction of propagation of the laser beam within an angle of ±15° with respect to the focal line of the laser beam are then evaluated by a photodetector device to determine the desired parameter. The intensity of the laser beam is reduced if the anode current of the photodetector exceeds a preset limit. The output signal of the photodetector device is fed to a potentiometer which has a logarithmic resistance per unit of its length. The output of the potentiometer is fed to a fixed single channel pulse height analyzer, which records all the pulses above a predetermined threshold value and transmits them to a counter.

3,646,353

FLYING SPOT SCANNER BLANKING

Pushpinder S. Bhullar, and Robert A. Wright, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,969
Int. Cl. G01n 21/16
U.S. Cl. 250—219 DF 6 Claims



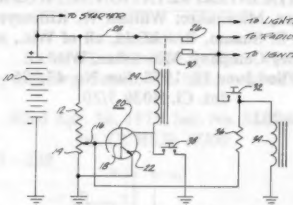
A flying spot scanner is employed to inspect a web which rides over a supporting surface. Optical signals are produced at the edges of the web, and at the edges of the surface; and optical web defect signals are produced while scanning the web. To blank signals which are not web dependent, the invention proposes to split scan-produced signals into first and second halves thereof, whereby web-edge defining signals may be isolated, and employed to operate a blanking circuit. To prevent the registering of defects which are proximate the edges of the web, each pair of blank-defining signals produced during a given scan are shifted timewise to a subsequent scan, one of each such pair being shifted a little more, and the other of each such pair being shifted a little less, than a scan duration.

3,646,354

ELECTRICAL SUPERVISORY CONTROL

Joe W. Von Brimer, Apt. 2, 3664 Vegas Plaza Drive, Las Vegas, Nev.

Filed Nov. 5, 1970, Ser. No. 87,190
Int. Cl. H02g 3/00
U.S. Cl. 307—10 BP 8 Claims



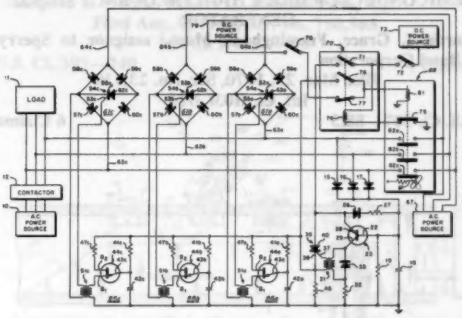
A control circuit is connected into the electrical system of a vehicle such as an automobile having a starting motor, a battery, and various current-consuming load devices, such as headlights. A relay-operated switch is connected between the battery and the load devices. A potentiometer is connected across the battery, and the relay winding and a transistor are connected across the potentiometer with the potentiometer slider connected to the base of the transistor and the collector connected to the relay winding. The resistance values are chosen such that when the battery is substantially charged, the voltage across the base-emitter junction of the transistor is sufficient to keep the transistor conducting, thus causing the relay to be energized and the switch to be closed, connecting the load devices to the battery. Should the battery be run down, as through leaving the headlights on, the battery voltage will drop, and at some desired proportion of full charge the voltage across the base-emitter junction will become too low to keep the transistor conducting, and the relay will drop out, opening the switch and disconnecting the load devices. A reset switch is provided to reconnect the remaining battery voltage across the relay winding.

3,646,355

AUTOMATIC POWER TRANSFER SWITCH

Ralph H. Ireland, Warminster, and Edward C. Lesoravage, Doylestown, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 19, 1970, Ser. No. 38,813
Int. Cl. H02j 9/06
U.S. Cl. 307—64 8 Claims



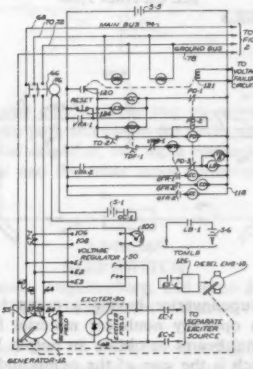
A static switch is operated upon sensing a loss of a primary power supply for providing a rapid temporary connection of a secondary power supply to a load. Slower acting power contactors are also energized and their operation provides a permanent connection of the secondary power supply to the load and also provides means for disconnecting the path of secondary power through the static switch.

3,646,356

CONTROL SYSTEM FOR STARTING UP AND SYNCHRONIZING A PLURALITY OF GENERATORS AND METHOD OF OPERATION

George M. Hoffman, Springfield, Ohio, assignor to White Motor Corporation, Cleveland, Ohio

Filed Dec. 17, 1970, Ser. No. 99,162
Int. Cl. H02j 1/00
U.S. Cl. 307—87 20 Claims



An electrical control system for starting up and synchronizing a plurality of alternating current generators,

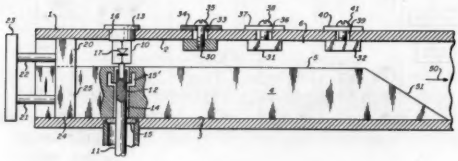
such as emergency power generators, and a method of operation thereof. The plurality of generators are simultaneously connected to a common busline, and motive power is simultaneously applied to each of the generators. As the generators begin to supply power, synchronizing circuits monitor the power developed by each generator and cause the generators to maintain substantially identical speeds as the generators are brought up to a normal operating speed. Accordingly, when the speed of the generators reaches the normal operating speed, the generators are in synchronization. The common busline may then be coupled to the main voltage supply line to thereby energize the main supply line.

3,646,357

SEMICONDUCTOR DIODE HIGH FREQUENCY SIGNAL GENERATOR

Martin I. Grace, Framingham, Mass., assignor to Sperry Rand Corporation

Filed Mar. 27, 1970, Ser. No. 23,130
Int. Cl. H03f 3/10
U.S. Cl. 307—88.3 **6 Claims**



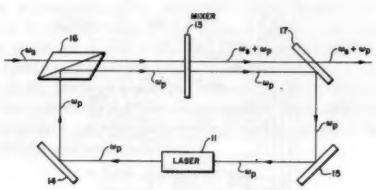
A microwave or high-frequency amplifier or frequency converter is disclosed which exploits avalanche phenomena in a semiconductor high-efficiency mode diode placed in a multiply tuned waveguide transmission line circuit. The novel configuration features means substantially avoiding loss of power within the circuit when high frequency or microwave energy is not present in the circuit; such energy may be efficiently amplified or converted when actually present in the circuit.

3,646,358

OPTICAL UPCONVERTER

Arthur H. Firester, Kendall Park, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed May 15, 1970, Ser. No. 37,647
Int. Cl. H03f 7/04
U.S. Cl. 307—88.3 **6 Claims**



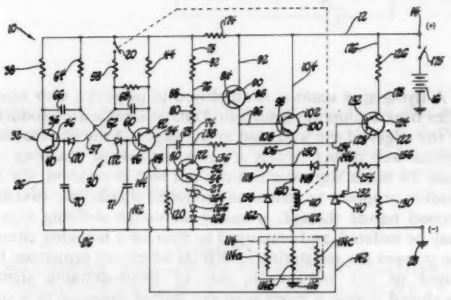
An optical upconverter having a pump beam, a signal beam, and an optically nonlinear material for mixing the pump and signal beams to obtain an output beam having a frequency which is the sum of the pump and signal beams. The pump beam is generated by a laser and the nonlinear material is mounted in the laser cavity. The laser beam is a linearly polarized plane wave. The signal beam is directed into the cavity through a polarizer which linearly polarizes the signal beam in a direction which is orthogonal to the pump beam. The nonlinear material is cut and oriented in the cavity such that nonlinear mixing of the pump beam will occur only with the signal beam and not with itself. Therefore, depletion of the pump beam will occur only during mixing with the signal beam, and second harmonic generation of the pump beam will not occur.

3,646,359

FLASHER CIRCUIT WITH OUTAGE INDICATION

John F. Bolinger, Michigan City, Ind., assignor to Meridian Industries, Inc., Southfield, Mich.

Filed May 7, 1970, Ser. No. 35,496
Int. Cl. H02h 7/20
U.S. Cl. 307—202 **8 Claims**



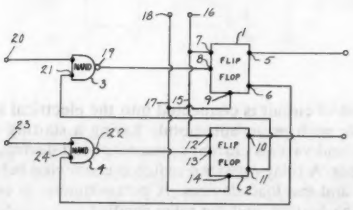
A flasher circuit has a power transistor controlling a circuit with a load therein; a multivibrator produces a timed pulse signal applied to the power transistor for turning the power transistor "on"; and additional current sensing means coupled to the load and sensitive to a reduction in the current flow therethrough, due to an outage, is operatively connected to the multivibrator for eliminating the timed occurrence of said signal.

3,646,360

DATA INTERPRETATION NETWORK

Odo J. Struger, Milwaukee; William W. Kiffmeyer, Bayside, and Loren E. Shaum, Brookfield, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed June 18, 1970, Ser. No. 47,206
Int. Cl. H03k 5/20
U.S. Cl. 307—233 **6 Claims**



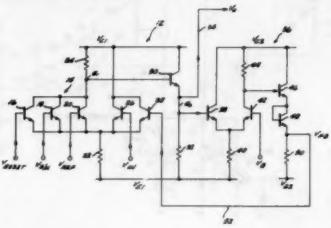
The outputs of four data interpretation circuits connect through a first and second OR gate to either a first or second monoshot circuit. The data interpretation circuits each receive two 90° phase displaced signals and their inversions from a position transducer attached to a numerically controlled machine. As the machine moves, these interpretation circuits detect voltage shifts in the position transducer signals and alternately fire the first and second monoshot circuits to generate a train of pulses at the output of the network as the machine moves. Each data interpretation circuit has two flip-

flops each triggered by the output of one of two NAND gates. An output of each flip-flop is connected to an input of the NAND gate connected to the other flip-flop. This inhibits the actuation of one flip-flop after the other flip-flop is triggered and the machine remains within predetermined limits such as occurs during vibration.

3,646,361
HIGH-SPEED SAMPLE AND HOLD SIGNAL LEVEL COMPARATOR

Harold J. Pfiffner, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 16, 1970, Ser. No. 81,235
Int. Cl. H03k *5/00*
U.S. Cl. 307—235 **18 Claims**

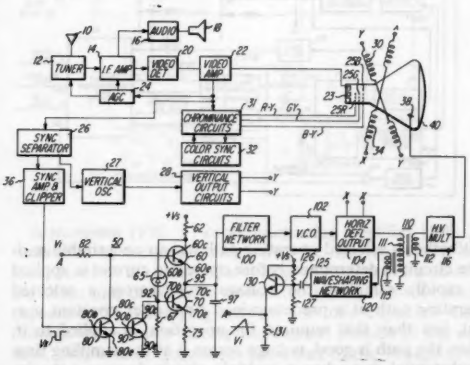


A sample and hold comparator fabricated with emitter coupled logic using only one transistor-type, resistors, and interconnects and including a differential comparator and logic circuit for comparing an input signal V_{IN} with a reference signal V_{REF} in response to a short duration sample and hold pulse V_{SIH} to produce a digital ONE or ZERO output signal depending upon whether the compared input signal is above or below the reference signal. The differential comparator and logic circuit being further responsive to a regenerative feedback signal produced by a differential amplifier in response to the output signal for latching or holding the state of the sample and hold comparator at the comparison state so that it is not further responsive to variations in the input signal V_{IN} until after a reset pulse V_{RESET} is received by it for clearing the sample and hold comparator circuitry.

3,646,362
SAMPLE-AND-HOLD CIRCUIT

Allen LeRoy Limberg, Somerville, N.J., assignor to RCA Corporation

Filed Apr. 30, 1970, Ser. No. 33,336
Int. Cl. H03k *17/00*
U.S. Cl. 307—238 **6 Claims**

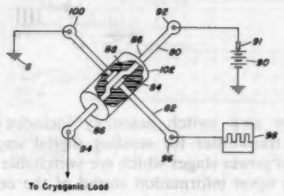


A sample-and-hold circuit employs first and second transistors of the same conductivity type, having serially coupled collector-to-emitter current paths and including a feedback path coupling the collector of the first transistor to the base of the second transistor to provide a high-input impedance and a relatively low-output impedance circuit suitable for rapid updating of a hold capacitor. The circuit samples an applied signal when the first and second transistors are keyed into conduction by keying circuit means, and holds when these transistors are biased out of conduction. The circuit is particularly suited for application as a phase comparator.

3,646,363
SUPERCONDUCTIVE APPARATUS

Robert C. Wright, Jr., 18 Lafayette Ave., Hingham, Mass., assignor to Wright, Robert C., Kendall Park, N.J.

Filed Aug. 6, 1968, Ser. No. 750,568
Int. Cl. H03k *17/00*
U.S. Cl. 307—240 **4 Claims**

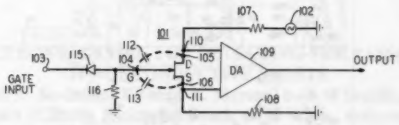


Apparatus is provided whereby the conductive state of means including an element capable of exhibiting superconductivity is controlled by the maintenance of said means in intimate thermal communication with a paramagnetic salt. The temperature of such means thereby being discretely and selectively changed by the control of the magnetic state of said paramagnetic salt.

3,646,364
CIRCUIT FOR REDUCING SWITCHING TRANSIENTS IN FET OPERATED GATES

William Kaminski, West Portal, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 17, 1969, Ser. No. 877,088
Int. Cl. H03k *17/60*
U.S. Cl. 307—251 **1 Claim**



An FET analog gate includes two equal-valued resistors, one in the source path and one in the drain path of the FET, and a differential amplifier, one input connected to the FET source terminal and the other input connected to the FET drain terminal.

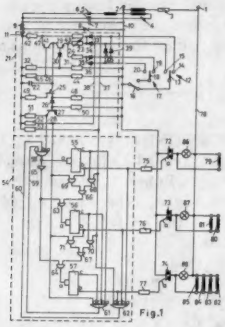
3,646,365
STEP SWITCH

Flemming Thorsoe, Augustenborg, and Arne Jensen, Havnbjerg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 17, 1970, Ser. No. 29,556
Claims priority, application Germany, Apr. 26, 1969, P 19 21 424.5
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 B **4 Claims**

The invention relates to a step switch assembly which switches power on and off in a stepwise manner in depen-

dence upon the upper and lower limiting values of a control signal. The switch assembly may be used for operating in a stepwise manner a bank of units such as motors wherein each motor, or group of motors, represents a portion or part of the total available capacity of a system such as air conditioning



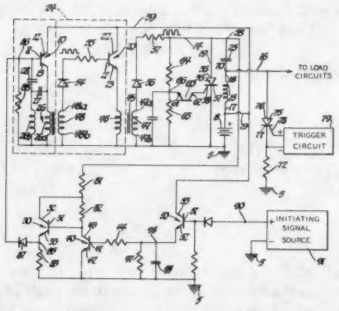
system. The step switch assembly includes a reversible counter, a transmitter for sending digital impulses to the counter, and power stages which are switchable on and off in dependence upon information stored at the counter output points.

3,646,366

CIRCUIT FOR PERIODICALLY REVERSING THE POLARITY OF A DIRECT CURRENT POTENTIAL SUPPLY LINE

James W. McNamee, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1970, Ser. No. 92,026
Int. Cl. H03k *17/30, 17/72*
U.S. Cl. 307—252 W **6 Claims**



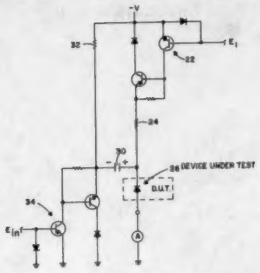
A circuit for periodically reversing the polarity of a direct current potential supply line. An inductor element is connected in series between the positive polarity output terminal of a direct current potential source and the supply line and the anode-cathode electrodes of a silicon controlled rectifier are connected across the series combination of a capacitor which is charged to a predetermined potential magnitude of a polarity in series aiding relationship with the direct current potential source, the inductor element and the direct current potential source. When the capacitor has been charged to the predetermined potential magnitude, the silicon controlled rectifier is triggered conductive through the anode-cathode electrodes to complete a discharge circuit for the capacitor through the direct current potential source and the inductor element. The potential drop across the inductor element produced by the capacitor discharge current reverses the polarity of the supply line with respect to the negative polarity terminal of the direct current potential source.

3,646,367

ELECTRICAL SWITCH

Paul L. Conant, Sr., Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Jan. 5, 1970, Ser. No. 532
Int. Cl. H03k *17/56*
U.S. Cl. 307—255 **2 Claims**



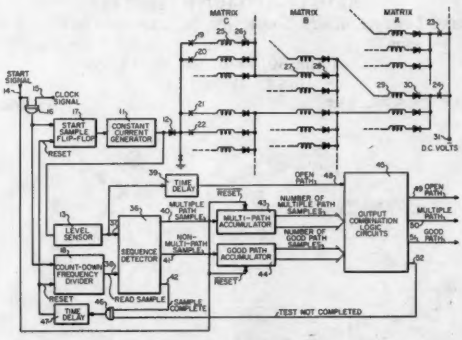
An electrical switch for large currents including a transistor element which is driven into saturation upon closing said switch. Means is provided to cause forward biasing of the base-collector junction of said transistor to force transistor current saturation.

3,646,368

CHECKING FOR UNDESIRABLE MULTIPLICITY OF MATRIX PATHS

Jeffrey P. Mills, Maywood, Ill., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed July 9, 1970, Ser. No. 53,354
Int. Cl. G01r *31/02;* **H04m** *3/26*
U.S. Cl. 307—269 **5 Claims**



Whether a selected operating path has an undesirable multiple circuit is determined before operating current is applied by rapidly sampling the voltage level across a selected operating path at a predetermined time after constant current, less than that required for operation, is applied to it. When the path is good, voltage across it at the sampling time is substantial, but when a multiple circuit decreases the inductive impedance normally provided by operating windings, the voltage is decreased. To provide the tests, a constant-cur-

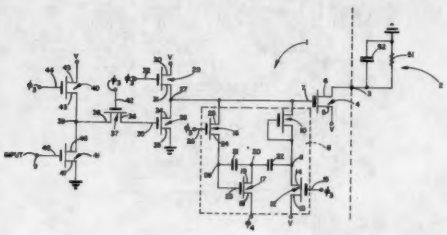
rent generator and a level sensor are momentarily connected to the selected operating circuit. Logic circuits receive the output of the level sensor and decide the condition of the selected path.

3,646,369

MULTIPHASE FIELD EFFECT TRANSISTOR DC DRIVER

Ted Y. Fujimoto, Santa Ana, Calif., assignor to North American Rockwell Corporation

Filed Aug. 28, 1970, Ser. No. 76,340
Int. Cl. H03k *3/26*
U.S. Cl. 307—270 **6 Claims**



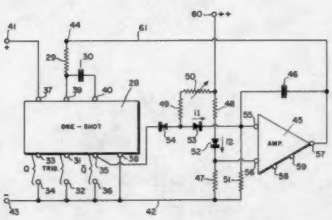
A voltage boosting circuit provides a boosted voltage level on the gate electrode of a field effect transistor driver in response to a logic input signal during a second phase of a four phase clock cycle. A field effect transistor connected as a rectifying device prevents the gate voltage from changing during at least the third and fourth phases of the clock cycle. As a result, the field effect transistor driver provides a DC output voltage level. During the second phase of the subsequent cycle, if the input has not changed, the gate voltage is reset to the boosted voltage level. If the input has changed, during the first phase of the clock cycle the gate voltage is reset to a different voltage level and maintained until the input again changes.

3,646,370

STABILIZED MONOSTABLE DELAY MULTIVIBRATOR OR ONE-SHOT APPARATUS

Peter Robert Lowe, Denver, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed July 6, 1970, Ser. No. 52,620
Int. Cl. H03k *3/10*
U.S. Cl. 307—273 **6 Claims**



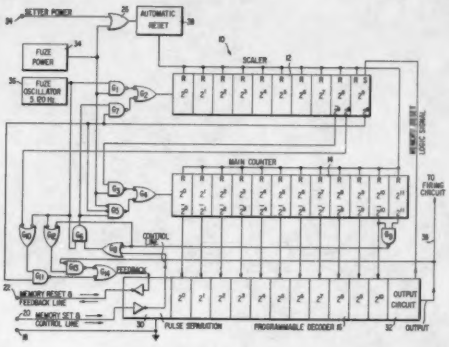
A transistor (FIG. 1) or an integrating amplifier (FIG. 2), controlled by a signal representing the duty cycle of a one-shot, controls the value of a voltage at one end of a resistor, the other end of which is connected to the one-shot timing capacitor. The charging current for this capacitor flows through this resistor during the excited periods of the one-shot, with a value dependent upon that of the voltage at the first-mentioned resistor end. The transistor or amplifier controls the value of this voltage as required to make the sum of the lengths of the excited periods over an extended period be a fixed percentage of the length of the extended period, and hence to make the average duty cycle constant at a desired value.

3,646,371

INTEGRATED TIMER WITH NONVOLATILE MEMORY

Friedrich W. Flad, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed July 25, 1969, Ser. No. 845,001
Int. Cl. H03k *17/28;* **F42c** *11/06*
U.S. Cl. 307—293 **3 Claims**



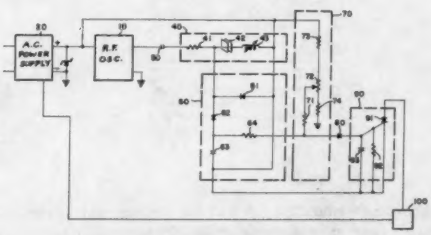
A remote settable electronic circuit timer system is described using an integrated MOS counter supplemented by an integrated programmable decoder consisting of MNOS transistors. Charge storage in the dielectric of the MNOS transistors is used to achieve memory without power. The setting information is counted into the counter at an accelerated rate and then transferred into the decoder, which serves as a memory. At the start of the timing operation, the counter is reset to zero. Then the counter counts up and when coincidence with the number stored in the decoder is achieved, an output signal is generated. The system automatically adjusts the setting for deviations of the oscillator frequency from its nominal value. Also, during the setting operation, all circuits of the timer are checked for proper functioning.

3,646,372

ELECTRONIC DEVICE FOR DETECTING THE PASSAGE OF NONCONDUCTIVE SHEETS

Donald L. Snellman; Richard A. Marson, both of Seattle, and Ernest D. Davis, Richmond Beach, all of Wash., assignors to Norfin, Inc., Seattle, Wash.

Filed June 5, 1967, Ser. No. 643,635
Int. Cl. G01n *27/00*
U.S. Cl. 307—308 **7 Claims**



Series inductance-capacitance circuit is coupled and tuned to resonance with a constant frequency signal source. The

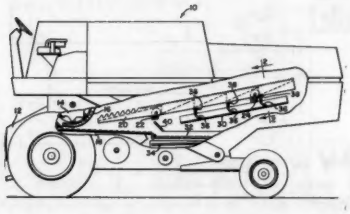
circuit includes capacitance sensor plates which sense the passage of double thickness nonconductive sheets and change the reactance of the circuit to produce a voltage change at the input to the circuit. This voltage change is detected and actuates a switch.

3,646,373

COMBINE SWEEP CONVEYOR

John Burch Hayes, Milan, Ill., assignor to Deere & Company, Moline, Ill.

Filed June 11, 1970, Ser. No. 45,435
Int. Cl. A01f *12/30*
U.S. Cl. 130—26 4 Claims



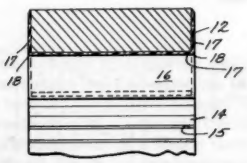
A combine having a threshing unit, a plurality of straw walkers mounted in crop-receiving relationship to the threshing unit for rotational translatory movement, a cleaning unit mounted beneath the straw walkers, a fixed grain pan mounted between the straw walkers and grain pan having a terminal end positioned over the material-receiving portion of the cleaning unit, and a plurality of resilient sweeps secured to and depending from each of the straw walkers along the length thereof for engaging material on the pan and moving the material to the terminal end of the pan during the lower portion of the path of travel of the straw walkers.

3,646,374

THERMOSETTING POLYESTER AND POLYESTER-IMIDE RESINS FOR ELECTRICAL INSULATION

Manuel A. Jordan; Edmund J. Zalewski, both of Schenectady, and Julian E. Newell, Jr., Scotia, all of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Mar. 20, 1970, Ser. No. 21,352
Int. Cl. H02k *15/12*
U.S. Cl. 310—45 5 Claims



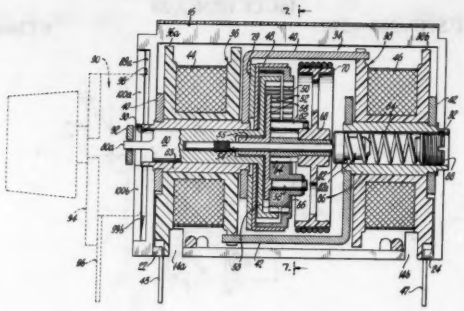
Improved thermosetting resins for coating and electrically insulating core members of dynamoelectric machine are disclosed. The resins include polyester and polyester-polyimide compositions derived from an alcohol component including tris (2-hydroxyethyl) isocyanurate.

3,646,375

MOTORIZED POTENTIOMETER WITH OVERLOAD CLUTCH AND INTERCHANGEABLE GEAR RATIO

Lawrence Mader, Yankton, S. Dak., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Dec. 30, 1970, Ser. No. 102,805
Int. Cl. H02k *7/05*
U.S. Cl. 310—83 16 Claims



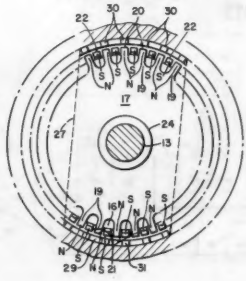
A compact gear motor having a planetary differential gear reduction system and an overload clutch which can be manually adjustable for clutch torque. The gear train accommodates interchangeable gears in order to change the output speed of the device. The gear motor drives a rotatable load such as a potentiometer, which is removably mounted directly to a hinged plastic motor housing.

3,646,376

HIGH-FREQUENCY TACHOMETER GENERATOR

Richard E. Anderson, Lynn, Mass., assignor to General Electric Company

Filed May 1, 1970, Ser. No. 33,639
Int. Cl. H02k *21/12*
U.S. Cl. 310—156 5 Claims



An AC tachometer generator having a lightweight rotor adapted to be mounted on a rotating shaft, the speed of which is to be measured. The rotor permanent magnet is protected from knockdown when the generator is disassembled by a pole piece construction enclosing the rotor. Flux from the rotor is alternately switched through a bridging member having axially extending fingers disposed on opposite sides of the rotor and aligned with rotor poles having opposite magnetic polarity.

3,646,377

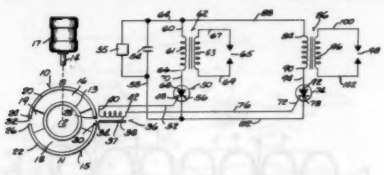
PULSE GENERATOR

David T. Cavil, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Original application Nov. 18, 1968, Ser. No. 776,379, now Patent No. 3,577,971. Divided and this application Sept. 2, 1970, Ser. No. 68,877

Int. Cl. H02k *19/24*

U.S. Cl. 310—168 3 Claims



Disclosed herein is a pulse generator including a rotor adapted to be driven by an engine and including a generally annular pole piece unit consisting of a pair of pole pieces in the form of circular ring sectors arranged around a common center with the ends of the pole pieces in adjacently spaced relation and separated by high-reluctance gaps, together with means for constituting one of the pole pieces a north pole. In arrangement for constituting the other of the pole pieces a south pole, and a trigger coil located adjacent the periphery of the rotor.

3,646,378

LOW-PRESSURE SODIUM VAPOR DISCHARGE LAMPS

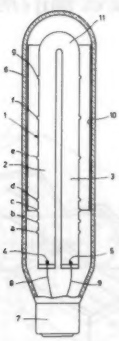
Urbaan Paul Marguerite Goossens, Waasmunster, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 22, 1970, Ser. No. 48,045

Claims priority, application Netherlands, Feb. 28, 1970, 7002894

Int. Cl. H01j *61/34*

U.S. Cl. 313—27 3 Claims



A low-pressure sodium vapor discharge lamp having small reservoirs of sodium positioned near the electrodes in a manner so as to satisfy the condition B/T 0.5, wherein B represents the overall contents of those reservoirs whose distance up to the nearest electrode is between 10 and 35 percent of half the length of the discharge path and T represents the overall contents of all reservoirs.

A heat-reflecting layer is positioned between the outer envelope and the discharge tube and extends over part of the length of the lamp to keep the reservoirs nearest the electrodes at cooler temperatures.

3,646,379

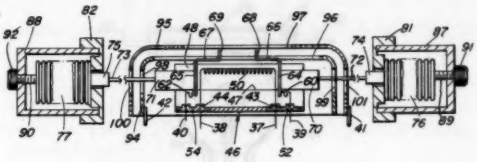
X-RAY TUBE HAVING CONTROLLABLE FOCAL SPOT SIZE

Khem Garewal, Stamford, Conn., and Barry M. Singer, New York, N.Y., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed May 18, 1970, Ser. No. 38,184

Int. Cl. H01j *35/00*

U.S. Cl. 313—57 15 Claims



An X-ray tube having means for controlling the width and length of a focal spot area on the anode target surface, the width being adjustable by varying respective positive biasing voltages which are applied to slotted metal cups positioned between the filament and the anode target surface, and the length being externally controllable and continuously adjustable by positioning two movable metallic elements, each being maintained at zero potential or negatively biased with respect to the filament and disposed between a respective end portion of the filament and the slotted metal cups.

3,646,380

ROTATING-ANODE X-RAY TUBE WITH A METAL ENVELOPE AND A FRUSTOCONICAL ANODE

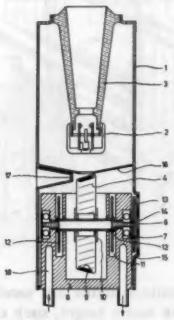
Walter Hartl, Stuffelring, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,169

Claims priority, application Germany, Aug. 19, 1968, P 17 64 846.3

Int. Cl. H01j *35/10*

U.S. Cl. 313—60 4 Claims

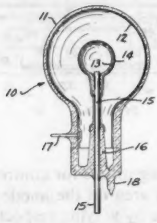


An X-ray tube having an evacuated metal envelope in which an anode is mounted for rotation about an axis perpendicular to an electron beam produced by a cathode. The anode is cooled and is frustoconical in shape, the inclined surface of which intercepts the electron beam. In a preferred embodiment, the anode is in the form of a disc consisting of molybdenum or graphite surrounded by a tire of tungsten or an alloy of tungsten and is at ground potential while the cathode is at a potential which causes X-rays to be generated and is secured to the envelope by an insulator having a recess for receiving a plug connected to a source of potential sufficient to generate X-rays.

3,646,381
SPHERICAL HALOGEN GEIGER TUBE

Richard H. Panther, and Charles Ralph Purser, both of Ottawa, Ontario, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence of Her Majesty's Canadian Government

Filed Nov. 4, 1968, Ser. No. 773,095
Claims priority, application Canada, Dec. 19, 1967, 007,990
Int. Cl. H01j *39/26, 17/06, 61/16*
U.S. Cl. 313—93 **2 Claims**

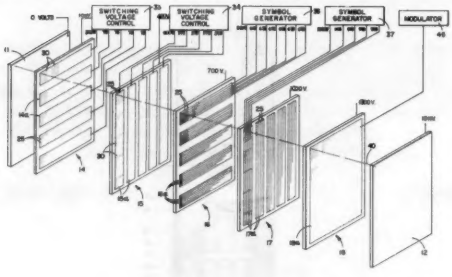


A nondirectional halogen quenched Geiger tube having concentrically arranged spherical anode and cathode, the space between the electrodes being filled with a gaseous mixture of neon, argon and bromine, which electrical connections provided to the two electrodes.

3,646,382
ELECTRON BEAM SCANNING DEVICE FOR SYMBOL AND GRAPHICAL INFORMATION

Walter F. Goede; John E. Gunther, both of Torrance, and Takeshi Noda, Los Angeles, all of Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

Filed July 20, 1970, Ser. No. 56,330
Int. Cl. H01j *43/22*
U.S. Cl. 313—104 **9 Claims**

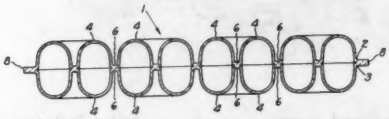


A plurality of control plates are sandwiched between an area electron source and a target, such control plates having apertures formed therein, the apertures of successive plates being aligned to form a plurality of electron channels between the electron source and the target. First control plates are utilized to direct electrons to a selected area of the target and have a first and second set of control electrodes arranged in parallel strips thereon, the first set of strips being orthogonal to the second set. The electrode strips each encompass a plurality of rows or columns of the apertures and thus define the height and width of the characters to be displayed. Second control plates are utilized to form the symbols to be displayed and have apertures formed therein aligned with the apertures of the first control plates to form a portion of the electron channels between the electron source and the target. The second control plates have mutually orthogonal strip electrodes formed thereon which are selectively energized to permit electrons to pass through portions thereof so as to define the symbols to be displayed.

3,646,383
FLUORESCENT PANEL LAMP

Clifton P. Jones, Willoughby, and William C. Martyny, Lyndhurst, both of Ohio, assignors to General Electric Company

Filed Jan. 9, 1970, Ser. No. 1,633
Int. Cl. H01j *00/00, 17/04*
U.S. Cl. 313—109 **6 Claims**

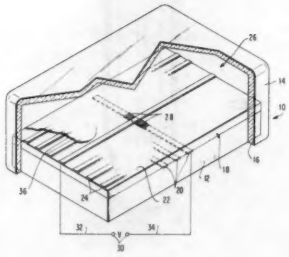


A fluorescent panel lamp having substantially uniform brightness over its face, and wherein the discharge channel is molded in both faceplate and backplate. Uniform brightness is achieved by making the gaps or slots between parallel channels narrow and deep in order to have multiple light reflections which raise the brightness within the slots approximately to that of the channels. A slot depth at least 1.2 times the slot width wherein the channel walls on each side do not depart from vertical by more than 10° is required. A lamp having eight channels within a nominal 12 inch size provides more light and operates more efficiently on lower current at higher wattage.

3,646,384
ONE-SIDED PLASMA DISPLAY PANEL

Frank M. Lay, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 9, 1970, Ser. No. 44,845
Int. Cl. H01j *61/30*
U.S. Cl. 313—109.5 **6 Claims**



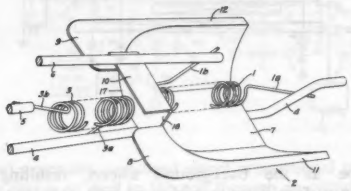
A thin glass sheet carries seats of spaced, parallel electrodes on opposite surfaces thereof and a gaseous atmosphere overlies one surface. Applying an alternating current voltage exceeding a critical value across selected electrodes of each set causes a gas discharge to take place on the surface carrying the gas at the area of selected electrode crossing with localized visible light output.

3,646,385

MOTOR VEHICLE HEADLIGHT AND DOUBLE-FILAMENT INCANDESCENT LAMP THEREFOR WITH GLARE LIGHT SHIELD

Gerhard Wichert, Munich, Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH

Filed Jan. 5, 1970, Ser. No. 567
Claims priority, application Germany, Jan. 10, 1969, P 19 01 179.1
Int. Cl. H01k *1/26*
U.S. Cl. 313—115 8 Claims



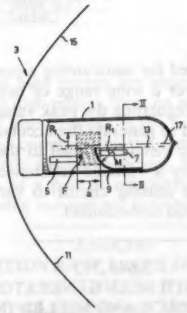
An incandescent motor vehicle headlight lamp having a pair of linear coiled filaments disposed in spaced tandem relation is provided with a scoop-shaped light-intercepting shield underlying the forward filament and having a rearward extension masking off the space between the two filaments as well as the region overlying the rearward filament back to the focal plane of the reflector.

3,646,386

HALOGEN FILAMENT LAMP FOR VEHICLE HEADLIGHT WITH SCREEN PARTIALLY SURROUNDING ANTIGLARE FILAMENT

Johannes Rijnders, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 9, 1969, Ser. No. 831,358
Claims priority, application Netherlands, June 8, 1968, 6808109
Int. Cl. H01k *9/08*
U.S. Cl. 313—115 4 Claims



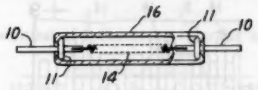
A halogen filament lamp for vehicle headlights in which a screen partially surrounds the antiglare filament within the lamp bulb to prevent blinding of a driver of an oncoming car. This screen has a reflecting surface that both blocks certain light rays and reflects same to the parabolic reflector.

3,646,387

ELECTRIC INCANDESCENT LAMP WITH TAPERED SEALING COLLAR

Reginald J. Ayres, Cape Coral, Fla., assignor to General Electric Company

Filed May 26, 1970, Ser. No. 40,508
Int. Cl. H01j *1/96*; H01k *1/18*; H01j *19/50*
U.S. Cl. 313—274 5 Claims



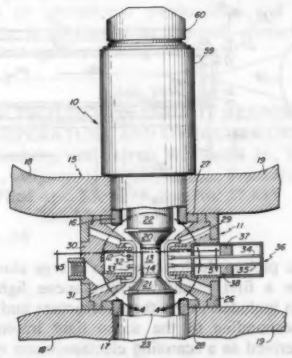
An electric incandescent lamp with its lead-in wires formed with an integral collar the periphery of which forms a hermetic seal with the lamp envelope. The method of manufacturing the lamp using this lead-in wire whereby the exhausting and filling operations are performed through one end of the envelope.

3,646,388

CROSSED FIELD MICROWAVE DEVICE

Kenneth W. Dudley, Sudbury, and George H. MacMaster, Waltham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 1, 1970, Ser. No. 42,180
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 10 Claims

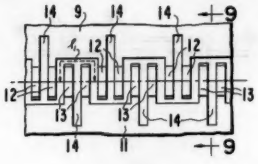


A traveling wave crossed field device is disclosed having dual sets of spaced conductive cathode electrode segments in parallel electrically with one set cooperating as a control element and the remaining set performing primarily as the emitter. Discrete electron cycloidal trajectories are considered in arriving at the spacing between adjacent elements. The cathode configuration provides for space charge control throughout the entire interaction region. Additionally, high-μ switching, as well as high-speed shutoff characteristics, has been achieved by means of very low-control voltage requirements.

3,646,389
REACTIVELY LOADED INTERDIGITAL SLOW WAVE CIRCUITS HAVING INCREASED INTERACTION IMPEDANCE AND TUBES USING SAME

John E. Hentschel, East Brunswick, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed June 14, 1966, Ser. No. 557,408
Int. Cl. H01j 23/28
U.S. Cl. 315—3.5 10 Claims

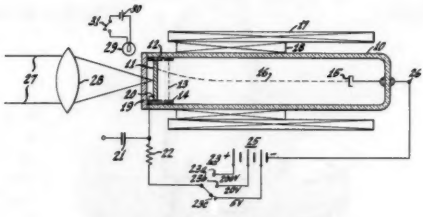


The present invention relates in general to reactively loaded interdigital slow wave circuits and, more particularly, to such circuits provided with elongated reactive loading elements to provide a more uniform intensity of the electric fields of the circuit in the interaction region, whereby the interaction impedance of the circuit is increased. Such improved circuits are especially useful for forward wave amplifiers both of the crossed field and O-type to provide increased efficiency and power output.

3,646,390
IMAGE STORAGE SYSTEM

Robert Steven Silver, Kendall Park, and Eduard Luedicke, Neshanic, both of N.J., assignors to RCA Corporation

Filed Nov. 4, 1969, Ser. No. 873,819
Int. Cl. H01j 31/26
U.S. Cl. 315—10 6 Claims



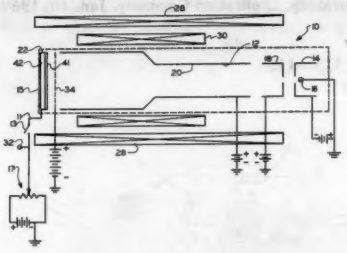
An image pickup device having a charge storage target is operated in a first mode whereby scene light discharges photodiodes included in the target structure and an electrical signal corresponding to the scene light impinging on the diodes is derived as a scanning electron beam recharges the diodes. Apparatus is provided for operating the device in a second mode whereby an optical scene image is stored in the insulator portions of the target between the photodiodes and which stored image may be read out subsequently in a nondestructive manner.

3,646,391
IMAGE-TRANSDUCING STORAGE TUBE

Steven R. Hofstein, Princeton, N.J., assignor to Princeton Electronic Products, Inc., Princeton, N.J.

Filed Nov. 13, 1969, Ser. No. 876,285
Int. Cl. H01j 29/50
U.S. Cl. 315—12 15 Claims

An electronic storage tube is disclosed which enables image-configurated radiant energy to be directly transformed into a corresponding charge pattern on an insulating mosaic surface of the tube target. In a preferred embodiment of the invention, the target of the tube comprised a doped silicon substrate, upon which a mosaic of insulating silicon dioxide islands has been formed. Those areas of the substrate not covered by the insulator are diffused with an impurity of the

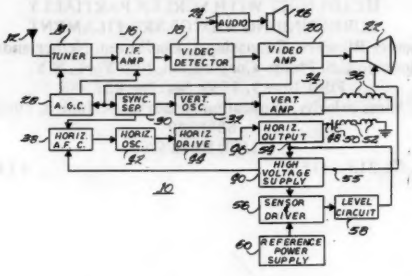


same type as the background silicon, resulting in a degenerate surface layer in said areas with consequent electrical isolation of said islands. Manipulative process steps are also set forth enabling formation of the charge pattern on said substrate, and enabling nondestructive readout thereof.

3,646,392
TELEVISION HIGH-VOLTAGE REGULATOR CIRCUIT

Joseph G. Zahnen, and George A. Kent, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Aug. 28, 1969, Ser. No. 853,844
Int. Cl. H01j 29/52; G05f 1/56
U.S. Cl. 315—22 12 Claims



A circuit is disclosed for maintaining a constant accelerating anode voltage over a wide range of beam currents in a cathode-ray tube by regulating the peak value of the horizontal retrace signal used to generate the accelerating voltage. A diode-capacitor clamp circuit coupled to the horizontal output stage is loaded by a variable resistance discharge path responsive through a sensing circuit to variations in beam current in the described embodiment.

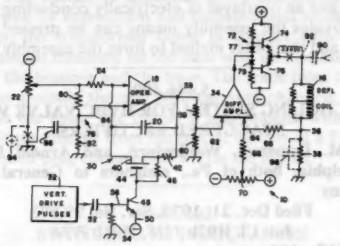
3,646,393
LINEAR SAWTOOTH SCAN GENERATOR UTILIZING NEGATIVE FEEDBACK AND MILLER INTEGRATION

William A. Tarr, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Sept. 10, 1969, Ser. No. 856,650
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD 14 Claims

A scan generator is provided which generates a stable, linear sawtooth current suitable for application to a magnetic deflection coil. An operational amplifier is bypassed by a capacitor so that it generates a linear ramp potential.

Synchronizing pulses cause a field effect transistor to discharge the capacitor and thus convert this ramp potential into a sawtooth potential. A differential amplifier measures the difference between this sawtooth potential and the potential across a resistor connected in series with the deflection



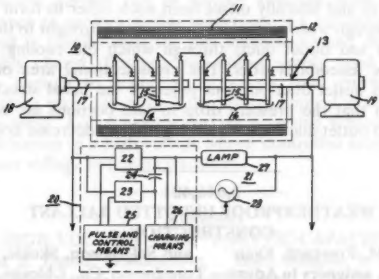
coil, and generates an output signal proportional to this difference that is applied to the coil through an output amplifier. A highly linear sawtooth scan is thus created which is stable even when subjected to varying supply potentials. The same circuit can be modified for use as a skew control circuit.

3,646,394

ACYCLIC GENERATOR WITH VACUUM ARC COMMUTATOR FOR RAPID GENERATION OF SHORT, HIGH-ENERGY PULSES

Paul S. Swartz, and Willem F. Westendorp, both of Schenectady, N.Y., assignors to General Electric Company

Filed Nov. 19, 1970, Ser. No. 91,127
Int. Cl. H02k *29/02, 31/02;* **H05b** *41/34*
U.S. Cl. 315—205 **13 Claims**



Short pulses of high energy are generated at a high-pulse rate by providing high energy from an acyclic generator having a plurality of discs rotating in the field of a superconductive field coil and commutating the output of the generator, through an electric discharge device connected across the same, by means of a pair of oppositely poled, sequentially operated triggerable vacuum arc devices.

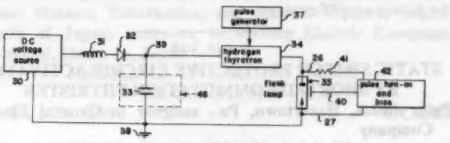
3,646,395

HIGH REPETITION RATE LASER OPTICAL PUMPING SYSTEM

Normand P. De Pratti, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 15, 1970, Ser. No. 37,547
Int. Cl. H01s *3/09*
U.S. Cl. 315—242 P **5 Claims**

A system for optically pumping a laser at high-repetition rates. This system utilizes a discharge from a high-voltage capacitor into a laser-exciting flashlamp. The capacitor discharge is controlled by switching action of a hydrogen thyratron tube. The thyratron switch is made to close when each voltage pulse in a pulse train is applied to a thyratron control grid. The switch is automatically opened after capacitor-discharge, by maintaining capacitor voltage below the



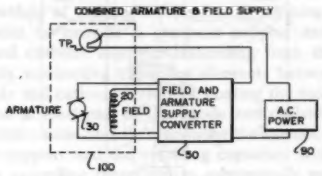
ionization potential of a thyratron tube for a fixed period of time.

3,646,396

OVERLOAD PROTECTION SYSTEM FOR DC MOTORS

Vincent A. Fischer, Cook County, Ill., assignor to Bodine Electric Company, Chicago, Ill.

Filed July 22, 1970, Ser. No. 57,180
Int. Cl. H02h *7/085*
U.S. Cl. 317—13 B **9 Claims**



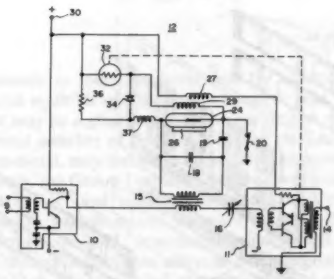
Apparatus for overload protection control of direct current (DC) motors wherein a heat and current responsive device is positioned in close proximity with the windings of the motor and electrically coupled to an alternating current (AC) power supply from which the motor power is derived through a suitable AC/DC converter or control. A current sensor monitors the power input to the motor to protect the motor from startup or operational overloading, and a thermal sensing device is positioned in thermal contact with the motor to protect against running overloads.

3,646,397

AMPLIFIER PROTECTION CIRCUIT RESPONSIVE TO TEMPERATURE AND OVERCURRENT

Ross E. Ruthenberg, and Joseph W. Spells, Jr., both of Des Plaines, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 13, 1970, Ser. No. 27,669
Int. Cl. H02h *7/20, 5/04*
U.S. Cl. 317—16 **10 Claims**



A protection circuit for the transistorized power amplifier of a transmitter is provided in the form of a normally shunted reactive circuit coupled in series with the input to the power amplifier stage means of a current stepdown transformer. When excessive current is drawn by the power amplifier or when an excessive temperature is reached the shunting cir-

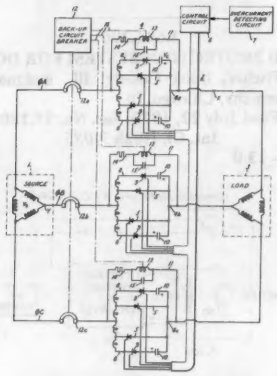
cuit is opened thereby connecting the reactive component in series between the driver stage and the power amplifier stage to partially detune the driver output, reducing the drive to the power amplifier stage.

3,646,398

STATIC SWITCH PROTECTIVE CIRCUIT ACTIVATED BY SHORTED COMMUTATION THYRISTER

Peter Kotos, Havertown, Pa., assignor to General Electric Company

Filed July 16, 1970, Ser. No. 55,365
Int. Cl. H02h *7/14*
U.S. Cl. 317—33 SC **5 Claims**



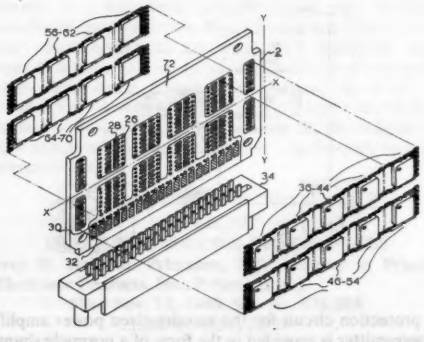
A protective circuit is provided for a thyristor switch connected between an AC source and a load. The switch includes a commutation thyristor and a DC charged commutation capacitor. The protective circuit includes a DC sensitive relay which, when energized, actuates a backup circuit breaker connected in series with said switch to isolate the source from the load. The relay is actuated by the discharge of the commutation capacitor if the commutation thyristor has shorted.

3,646,399

PRINTED CIRCUIT BOARD CONSTRUCTION

James R. Mars, Pittsfield, and Frederick S. Ciepiela, North Adams, both of Mass., assignors to General Electric Company

Filed Mar. 4, 1970, Ser. No. 16,389
Int. Cl. H02b *1/00*; H05k *1/18*
U.S. Cl. 317—100 **6 Claims**



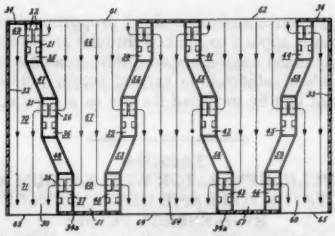
A composite circuit board assembly is formed having a laminated-type construction including surface layers of thermally conducting material having spaced openings for location of recessed mounting means for the electrical components. The openings can be etched after lamination of a composite layer which provides the heat-sink function and the assembly means. Alternately, a thermally conducting layer can be laminated upon a substrate already having the openings and an overlayer of electrically conducting material which provides the assembly means can be pressed into the openings and thereafter etched to form the assembly sites.

3,646,400

AIR-COOLING SYSTEM FOR HVDC VALVE WITH STAGGERED RECTIFIERS

Donald M. Demarest, Wallingford, and Arnold I. Shore, Philadelphia, both of Pa., assignors to General Electric Company

Filed Dec. 21, 1970, Ser. No. 99,893
Int. Cl. H02b *1/18*; H01b *7/34*
U.S. Cl. 317—100 **7 Claims**



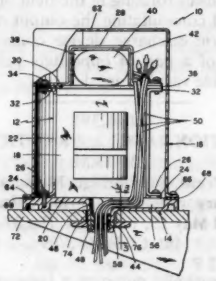
Disclosed is a housing arrangement for a plurality of rectifier holding assemblies comprising a solid-state valve(s) of a high-voltage converter. The assemblies are mounted on panel structures which are disposed between sidewalls arranged parallel to and laterally offset from each other to form inlet ducts through which a cooling fluid may be brought to the assemblies and outlet ducts through which the cooling fluid from the assemblies exits. The cross-sectional area of the inlet and outlet duct portions adjacent the panel structures are such that the pressure drop in said portions are equal. Inlet and outlet ducts are mated together to decrease housing size.

3,646,401

WEATHERPROOF UNPOTTED BALLAST CONSTRUCTION

Ernest M. Freegard, Evanston, and Sol Hasson, Skokie, both of Ill., assignors to Advance Transformer Co., Chicago, Ill.

Filed Jan. 29, 1971, Ser. No. 110,897
Int. Cl. H05k *5/04*
U.S. Cl. 317—100 **18 Claims**



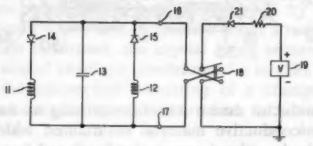
A ballast for gaseous discharge devices especially intended for connection to outdoor mercury lamps which is con-

structed to run cool and to be weatherproof. A transformer and condenser are mounted as a unit within a housing on an integral base of high heat conductivity metal and separated together from the canister or housing by airspace, and likewise separated from one another by airspace and a heat barrier. The ballast is unpotted and transfers heat to the housing wall by convection and radiation and to the base by condition, the transformer being in contact with the base. The housing is mounted on the base with an elastomer gasket between the housing and the base. The leads from the ballast are led to a nipple through wire-carrying channels integrally formed in the base. The nipple is also integral with the base and the leads emerge from the ballast by way of a frustoconical elastomer plug compressed within the nipple.

3,646,402
SWITCHING OF INDUCTANCES

Joseph Henry Condon, Summit, and David William Hagelbarger, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 20, 1970, Ser. No. 65,616
Int. Cl. H01f 27/42
U.S. Cl. 317—137 **12 Claims**

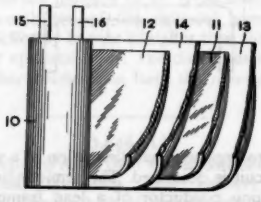


Electric current can be rapidly switched from one inductance to another similar inductance if a capacitor is connected in parallel with the two inductances and diodes are suitably placed. The required power supply need only be large enough to maintain the steady state current flow. Switching takes place when the voltage applied to the circuit is reversed. An exemplary current reversing scheme uses a combination of a high voltage silicon controlled rectifier and a lower voltage switching transistor.

3,646,403
HIGH-VOLTAGE ELECTROLYTIC CAPACITOR

Franz S. Dunkl, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Oct. 23, 1970, Ser. No. 83,568
Int. Cl. H01g 9/00
U.S. Cl. 317—230 **4 Claims**

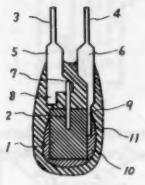


An electrolytic capacitor suitable for operating at high voltages is produced by combining a glycol-borate electrolyte together with N-methyl pyrrolidone and a moderately hydrogen-bonding solvent. The electrolytic capacitor has a wide range of temperature conditions, operates at high voltages and retains stable electrical characteristics at these levels.

3,646,404
SOLID-STATE ELECTROLYTIC CAPACITOR AND METHOD OF MAKING SAME

Masao Matsuo, Takarazuka, and Hiroshi Tomiwa, Osaka, both of Japan, assignors to Matsuo Electric Company, Limited, Osaka-fu, Japan

Filed Jan. 13, 1971, Ser. No. 106,172
Int. Cl. H01g 9/05
U.S. Cl. 317—230 **6 Claims**

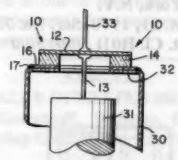


The method of making a capacitor by forming a piece of sheet metal to provide a common support and alternate anode and cathode members extending from the support, electrically connecting capacitor elements between each of said anode and cathode members, coating the individual elements and at least part of the anode and cathode members with a plastic resin and then severing the members from the common support and the resulting capacitor which has the terminals extending therefrom in substantially parallel relationship.

3,646,405
HERMETIC SEAL

George Wallis, Lexington; John J. Dorsey, Waltham, and Bernard L. Phillips, Norwood, all of Mass., assignors to P. R. Mallory & Co. Inc., Indianpolis, Ind.

Filed Jan. 8, 1969, Ser. No. 789,799
Int. Cl. H01g 9/10
U.S. Cl. 317—230 **33 Claims**



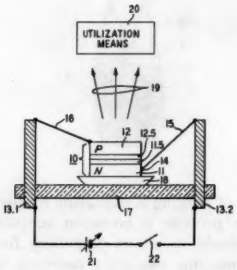
An insulator to metal hermetic seal for electronic components and methods of making the hermetic seal. The hermetic seal may be a glass to metal or a ceramic to metal seal. The terminal member of the seal, whether glass to metal or ceramic to metal, may include a metal selected from the low-carbon steels, the Group I metals (copper, silver and gold, or alloys thereof or clad materials thereof), the Group VIII metals (nickel, palladium and platinum or alloys thereof or clad materials thereof), iron-nickel-cobalt alloys or clad materials thereof, nickel-iron alloys or clad materials thereof, chromium-iron alloys or clad materials thereof or a metal from any one of the film-forming metals which can form an electrolytic oxide film such as tantalum, aluminum, niobium, titanium, zirconium alloys thereof or clad materials thereof. The glass member may include any one of the borosilicate, potash-soda-barium, potash-soda-lead, soda-lime or aluminia-silicate glasses. The ceramic member may include any one of alumina, steatite, fosterite, or beryllia.

3,646,406

ELECTROLUMINESCENT PN-JUNCTION DIODES WITH NONUNIFORM DISTRIBUTION OF ISOELECTRONIC TRAPS

Ralph Andre Logan, Morristown; Harry Gregory White, Bernardsville, and William Wiegmann, Middlesex, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 30, 1970, Ser. No. 51,067
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 R 6 Claims



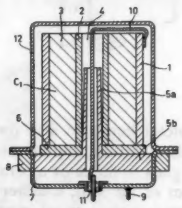
An electroluminescent PN-junction diode containing isoelectronic traps is fabricated with a relatively high concentration of such traps located within a few diffusion lengths of the PN-junction and a relatively low concentration of such traps farther away from the junction. Thereby, absorption by such traps away from the junction, of radiation emitted at such traps at the junction, is minimized. In particular, a method is described for epitaxially growing such a gallium phosphide PN-junction diode with a higher concentration of isoelectronic nitrogen traps near the junction than elsewhere in the diode.

3,646,407

RADIATION DETECTOR HAVING A SEMICONDUCTOR CRYSTAL

Johannes Meuleman, Czen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 21, 1970, Ser. No. 73,857
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R 7 Claims



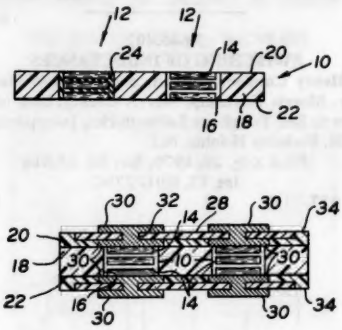
A radiation detector in which a semiconductor crystal having a substantially central cavity is used around which a radiation-sensitive junction is provided between two zones of opposite conductivity-types which may be separated by an intrinsic zone, said crystal being accommodated in a hermetically sealed envelope consisting of a boxlike holder and a cover, in which connection means for the crystal on the envelope consist of a rigid pin which is connected to the boxlike holder, said pin being guided between the aperture of the crystal and forcibly pressing therein against the wall of the cavity.

3,646,408

SEMICONDUCTOR WIRELESS VOLTAGE AMPLIFIER MOUNTED ON A DIELECTRIC SUBSTRATE

Ledyard Kastner, c/o L-K Engineering Co., 3579 Merrick Road, Seaford, N.Y.

Continuation-in-part of application Ser. No. 786,628, Dec. 24, 1968, now abandoned , and a continuation-in-part of 699,100, Jan. 19, 1968, now Patent No. 3,589,003, and a continuation-in-part of 699,205, Jan. 19, 1968. This application Jan. 13, 1971, Ser. No. 106,267
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R 10 Claims



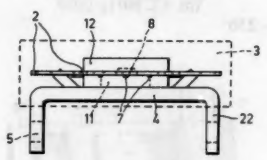
A semiconductor construction comprising an assembly of layered semiconductive material maintained within a nonconductive body without connecting leads and its application as part of an integrated construction of electronic components.

3,646,409

HEAT-SINKING PACKAGE FOR SEMICONDUCTOR INTEGRATED CIRCUIT

Johannes Theodorus van de Water; Joannes Joseph Van Hout, and Arie Baelde, all of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 29, 1969, Ser. No. 845,921
Claims priority, application Netherlands, July 30, 1968, 6810761
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R 5 Claims



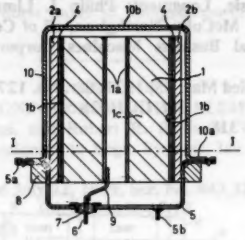
A package to improve heat dissipation of a semiconductor integrated circuit is described. The semiconductor crystal is mounted on one conductor of a lead frame, to which is joined a cooling block, and then the assembly encapsulated in a resin envelope, such that the whole block, except for the side joined to the conductor, lies outside the plane of the conductors. In this way, adequate heat dissipation is ensured via the block rather than the lead conductors themselves. If desired, this first package can then be encapsulated in a second resin envelope containing a second conductor set and a second cooler in the form of a plate.

3,646,410

RADIATION DETECTOR HAVING A CLAMPED CRYSTAL

Johannes Meuleman, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 17, 1970, Ser. No. 73,119
Claims priority, application France, Sept. 24, 1969, 6932554
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R 7 Claims



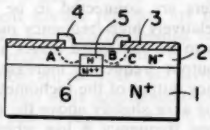
The invention relates to a radiation detector which comprises a crystal having two coaxial zones of opposite conductivity types, which zones may be separated by an intrinsic zone, between which first-mentioned zones a radiation-sensitive junction is formed, the crystal being secured in a hermetically sealed envelope consisting of a boxlike holder and a cover, the connection consisting of a clamping support which encloses the crystal and which is secured to the boxlike holder.

3,646,411

SURFACE BARRIER JUNCTION DIODE

Minetaka Iwasa, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1969, Ser. No. 885,584
Claims priority, application Japan, Dec. 20, 1968, 43/94071
Int. Cl. H01l *3/00*
U.S. Cl. 317—235 UA 2 Claims



A surface barrier junction diode is disclosed in which the impurity concentration of the epitaxial layer immediately beneath the Schottky barrier is higher than that of the other regions of the epitaxial layer. The diode has improved voltage-current characteristics in both the reverse and forward directions.

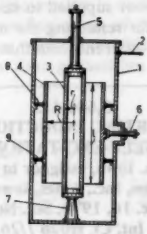
3,646,412

CYLINDRICAL CAPACITORS WITH GAS DIELECTRICS

Rintje Boersma, Harmelen, and Hulbert A. J. M. Spoorenberg, Utrecht, both of Netherlands, assignors to N. V. "COQ", Utrecht, Netherlands

Filed Oct. 23, 1969, Ser. No. 868,763
Claims priority, application Netherlands, Mar. 20, 1969, 6904281
Int. Cl. H01g *3/02*
U.S. Cl. 317—244 7 Claims

In a cylindrical capacitor having a gaseous dielectricum the relation between the coefficient of expansion of the material of the inner cylinder of the capacitor and the gas pressure, which is held steady, being such as to make the capacity of



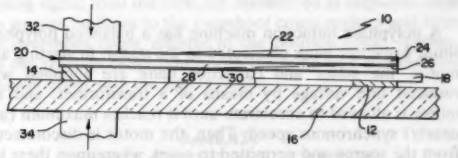
the capacitor substantially independent of temperature variations within the operational temperature range of the capacitor.

3,646,413

PIEZOELECTRIC-DRIVEN VARIABLE CAPACITOR

Johannes A. F. Oomen, Cincinnati, Ohio, assignor to Avco Corporation, Cincinnati, Ohio

Filed Sept. 25, 1970, Ser. No. 75,532
Int. Cl. H01g *7/06*
U.S. Cl. 317—246 5 Claims



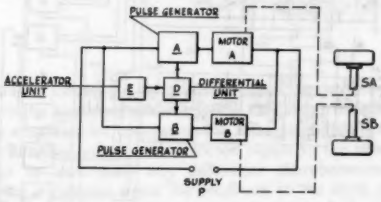
A piezoelectric-driven variable capacitor for creating a voltage-controlled variable reactance useful at high frequencies and high-power levels is disclosed. A piezoelectric flexure element is used as one of the capacitor plates. Means are provided to compensate for uneven expansion of the piezoelectric flexure element.

3,646,414

ELECTRICALLY OPERATED DRIVE SYSTEMS

David Gurwicz, Gateshead, Durham, England, assignor to Sevcon Engineering Limited and Ransomes Sims & Jefferies Limited

No Drawing. Continuation-in-part of application Ser. No. 682,468, Nov. 13, 1967, now abandoned. This application Apr. 28, 1970, Ser. No. 32,689
Claims priority, application Great Britain, Nov. 14, 1966, 51,010/66
Int. Cl. H02p *7/68*
U.S. Cl. 318—67 11 Claims



Electrically operated drive system for driving coaxial shafts comprising two electric motors, two switching circuits for

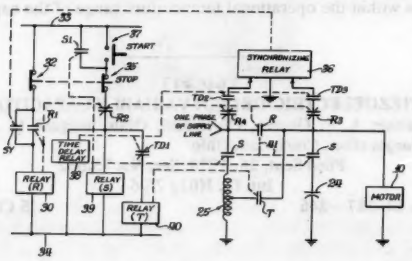
respectively connecting the motors to and disconnecting them from an electrical supply, the switching circuits being each adapted alternately and for variable periods to connect and disconnect the supply to and from the associated motor so that the means power supplied to said associated motor is variable and means for rendering the means power supplied to one of the motors different from that supplied to the other motor.

3,646,415

SYSTEM FOR STARTING INDUCTION MOTORS WITH SELF-EXCITATION

David D. Robb, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 16, 1970, Ser. No. 98,757
Int. Cl. H02p 1/26
U.S. Cl. 318—229 **6 Claims**



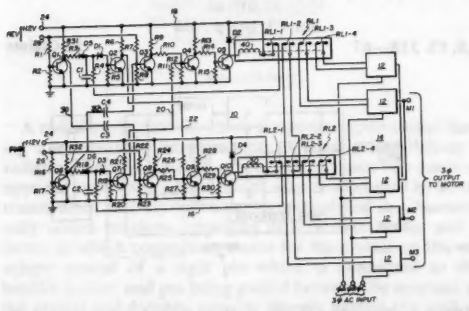
A polyphase induction machine has a balanced polyphase shunt capacitor bank connected to the stator. In starting as a motor, the stator and capacitor bank are supplied with reduced line voltage by means of a transformer, and the motor is allowed to accelerate until it reaches maximum (and nearly) synchronous speed. Then, the motor is disconnected from the source and permitted to coast, whereupon there is a building up of stator voltage by self-excitation. When the phase and amplitude of the self-excited voltage are approximately equal to the phase and amplitude of the line voltage, the stator is connected directly to the line and the transformer and excitation capacitor are disconnected. The starting is accomplished with minimal dip in line voltage.

3,646,416

SOLID-STATE CIRCUIT CONTROLLED THREE-PHASE REVERSING STARTER

Cecil W. Davidson, Dallas, Tex., assignor to Forney Engineering Company, Dallas, Tex.

Filed Oct. 27, 1970, Ser. No. 84,281
Int. Cl. H02p 1/40
U.S. Cl. 318—207 R **2 Claims**



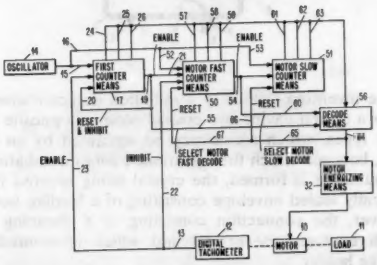
A protective solid-state logic circuit controlling the operation of an AC motor energized by a three-phase current supply in which two phases are reversed to reverse rotation of the motor, is provided with critical time delay components for causing electrical braking of the running motor by the provision a certain relatively short AC power reversal time for stopping the so running motor without creating damaging short circuiting in the system, each time the direction of rotation of the motor is reversed by switching the logic circuit.

3,646,417

DIGITAL SPEED SERVOMECHANISM

John V. Cassie, Longmont; Philip J. Lima, Boulder, and Everette R. McCully, Northglenn, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1971, Ser. No. 127,913
Int. Cl. H02p 5/16
U.S. Cl. 318—318 **17 Claims**



The speed of rotation of a motor is controlled by a closed-loop digital speed or velocity servomechanism which derives distance information from a digital motor tachometer and derives time information from a counter arrangement, the counter being driven by a stable high-frequency oscillator. The value of the count at the time of occurrence of a tachometer pulse is a measure of motor speed and is used to determine the mode of motor energization which will occur until the time of next tachometer pulse, at which time a new motor energization decision is made.

Three counters are connected to be sequentially incremented by a relatively high-frequency oscillator. The motor whose speed is to be controlled drives a digital tachometer whose pulse output frequency increases with speed. The highest frequency output of the tachometer occurs when the motor is running at or slightly above the desired speed; however, this highest frequency is low when compared to the oscillator frequency. Each tachometer pulse initiates counting in the first counter and also initiates decoding or sampling of the count then in the second counter when the motor is fast, or decoding or sampling of the third counter when the motor is slow. This decoding or sampling determines the mode of motor energization which will exist until the occurrence of the next tachometer pulse, the period between adjacent tachometer pulses constituting a speed-error sampling period.

During the interval between adjacent tachometer pulses, a count first advances through the first counter, then into the second counter, and then, if the motor is slow, into the third counter. The occurrence of a tachometer pulse while the second counter is advancing indicates that the motor is fast, and the specific value of the count quantitatively indicates the amount of motor overspeed. The occurrence of a tachometer pulse at a later time, after the second counter has filled and the third counter is advancing, indicates that the motor is slow, and the value of the count quantitatively indicates the amount of motor underspeed.

The decoding function is completed as the first counter advances during the next speed-error sampling period. Before

the first counter fills, to thereafter cause the second counter to advance, the decoding function is completed and the second and third counters are reset to an initial state, thereby conditioning them for their operation in this next speed-error sampling period.

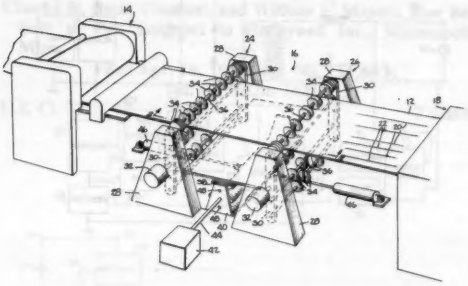
During the initial acceleration interval, when the motor is rapidly accelerating from zero velocity toward the command or desired velocity, a given high-order count is preset into the third counter. The motor receives continuous energization until its velocity has increased to the desired velocity. At this time, the preset count in the third counter no longer exists, and the acceleration mode of energization of the motor is terminated.

3,646,418

POSITIONING OF MULTIPLE ELEMENTS

Robert B. Sterns, and Robert R. Richards, both of Great Neck, N.Y., assignors to Logic Systems, Inc., Great Neck, N.Y.

Filed July 22, 1969, Ser. No. 843,322
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 **28 Claims**



Working elements such as cutters or scorers for operating at different width positions across a lengthwise moving web, such as paperboard, are positioned widthwise by according to a digitally coded program. Each element, which is provided with a position storage register, is moved along by an associated yoke which is also provided with a position storage register. The element storage registers are programmed, as from a tape etc. to a count corresponding to a desired new position. The yoke registers maintain a count corresponding to their actual position. All the yokes are driven along a common path across the web while simultaneous comparisons are made between each pair of registers. As the comparisons for each pair of registers reach zero the yoke is declutched and remains in position until all the others have been positioned. The yokes may then be disengaged from their elements for repositioning of other elements by making similar comparisons and driving the yokes to the positions of these other elements. Possible errors in position programming are detected prior to driving the yokes by making comparisons between the programmed element storage registers to ascertain the presence of improper register signals which call for a shift in the order of the elements.

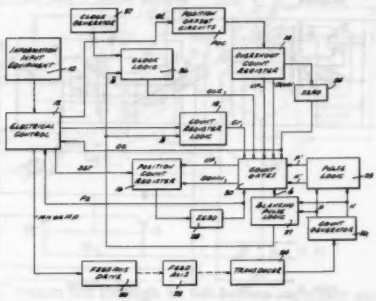
3,646,419

NUMERICAL CONTROL WITH POSITION OFFSET

Josef K. Holy, Torrance, and Esteban J. Toscano, Tarzana, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 5, 1969, Ser. No. 874,165
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 **4 Claims**

A record-controlled incremental positioning system for providing position offset without the need for returning the element being positioned to a zero point in a positioning axis. Desired position information is stored in a desired position count register. Overshoot movement is stored in an overshoot count register. The magnitude of the count of a preceding overshoot movement is combined, with the sign reversed, with a succeeding count of desired position in the desired position count register. Position offset is stored in manually set switches. Storage facilities independently of the



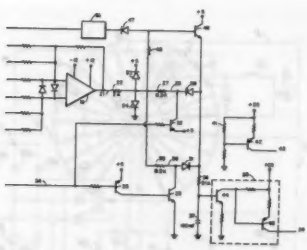
switches are provided for information identifying switches individually having both the old position offset and the new or succeeding position offset which, under the control of an initiating signal from the tape, are transferred in sequence from the storage facilities to the overshoot count register and from the overshoot count register to the position count register, the old position offset count with the same sign and the new position offset with the sign reversed.

3,646,420

BALANCE CIRCUIT FOR DC SERVOS

Martin O. Halfhill, and Frank J. Sordello, both of San Jose, Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Original application Aug. 20, 1969, Ser. No. 851,692, now Patent No. 3,601,676. Divided and this application Feb. 11, 1971, Ser. No. 114,577
Int. Cl. G05d *23/275*
U.S. Cl. 318—634 **6 Claims**

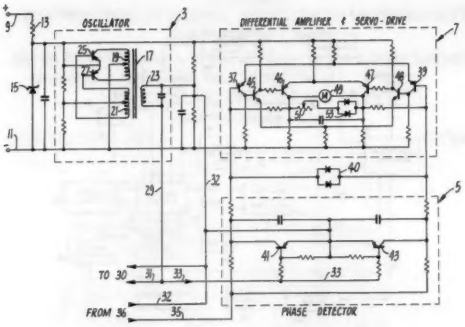


A balance circuit for neutralizing offsets and drifts of all inputs to the summing amplifier of a DC servo including: a balance amplifier for comparing the drive signal applied to a servo controlled motor with selected inputs to the summing amplifier to determine any difference therebetween and developing a balance signal for feedback to the input of the summing amplifier which is equal to, but out of phase with the difference, and circuitry for applying the balance signal during both the fine and coarse position steps of the servo operation.

3,646,421
WIND DIRECTION INDICATOR SYNCHRO SYSTEM

Robert D. Ogg, Portland, Maine, assignor to The Eastern Company

Filed Feb. 25, 1970, Ser. No. 14,000
Int. Cl. G05b 1/06
U.S. Cl. 318—654 1 Claim

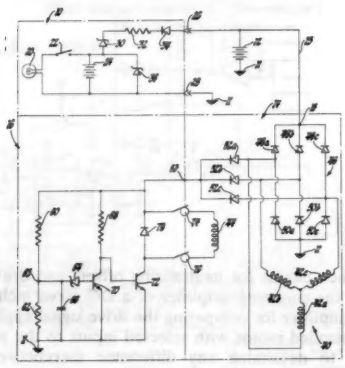


A synchro system of simple and inexpensive structure is provided which is particularly suitable for use as a wind direction indicator on sailboats. A transistorized oscillator is provided generating a current which is fed to a synchro transmitter which in turn is connected to an indicator. The indicator generates an error signal based on the phase difference between the current fed to the synchro and the position of a second synchro in the indicator and this phase difference is detected and amplified and used to operate a motor to turn the indicator. Variable damping can be employed.

3,646,422
CIRCUIT FOR RECHARGING THE BATTERY OF A PORTABLE DEVICE FROM THE CHARGING SYSTEM OF A CAR

Max E. Hankley, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1970, Ser. No. 65,623
Int. Cl. H02j 7/04
U.S. Cl. 320—53 3 Claims

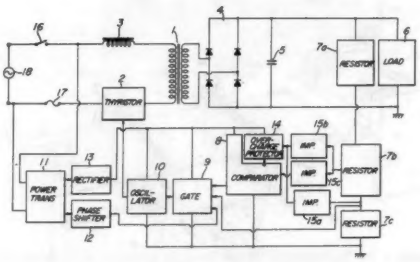


A first Zener diode connected from the positive terminal of a rechargeable battery for a portable electrical device to the output of a vehicle charging system and a second Zener diode connected across the terminals of the rechargeable battery. The first Zener breaks down when the output of the vehicle charging system is above the sum of the terminal voltage of the rechargeable battery and the breakdown voltage of the first Zener, and the second Zener breaks down when the output is above the sum of fully charged terminal voltage of the rechargeable battery and the breakdown voltage of the first Zener.

3,646,423
CONVERTER FOR CHANGING ALTERNATING CURRENT INTO DIRECT CURRENT

Kenzo Tatematsu, Amagasaki, and Teruhisa Kaneko, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 15, 1970, Ser. No. 46,322
Claims priority, application Japan, June 20, 1969, 44/49863; 44/49864; Aug. 29, 1969, 44/69483
Int. Cl. H02m 1/18; G05f
U.S. Cl. 321—14 14 Claims



A converter for changing alternating current into direct current by charging a large-capacity capacitor through a full wave rectification circuit which, together with a transformer, is connected to an AC power supply. The output voltage of a voltage divider circuit consisting of the above-mentioned capacitor and a parallel-connected resistor is compared with a predetermined reference voltage by a comparator circuit. Then, if the former is lower than the latter, a gate circuit is triggered to put a self-oscillating circuit into a state where it is ready for oscillation, and the oscillating operation of the above-mentioned self-oscillating circuit is triggered through the gate circuit connected to an intermediate point of a closed loop made up of a rectification circuit for rectifying an AC source voltage and of a part of the aforesaid voltage divider circuit, the output of the self-oscillating circuit providing a trigger signal for a thyristor means connected to the aforementioned transformer.

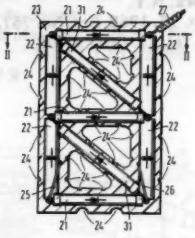
3,646,424
ELECTRICAL COMPONENT PROTECTED AGAINST HIGH TENSION, PARTICULARLY FOR COLOR TELEVISION RECEIVERS AND METHOD OF ITS PRODUCTION

Rainer H. Dangschat, Landsham, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 23, 1970, Ser. No. 5,321
Claims priority, application Germany, Jan. 23, 1969, P 19 03 351.3
Int. Cl. H02m 7/00
U.S. Cl. 321—15 1 Claim

A grid-shaped electrical component is formed by molding a plurality of electrically interconnected capacitors and diodes, physically forming a grid structure, within a synthetic

casting resin. The electrical components form the cores of the struts of the grid structure and each strut is provided with



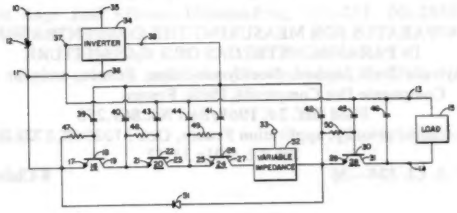
a plurality of indentations in the synthetic resin in the area of the walls of the components.

3,646,425

DC VOLTAGE MULTIPLIER

Charles H. Beck, Chalfont, and William F. Meyers, Blue Bell, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 16, 1971, Ser. No. 134,603
Int. Cl. H02m *7/00*
U.S. Cl. 321—15 **7 Claims**



A DC voltage multiplier having a plurality of voltage multiplying stages using transistors that are capacitively coupled to an inverter to conduct current in only one direction. A variable impedance is responsive to a signal to vary the factor of multiplication of the DC voltage multiplier between a maximum value and a lower value that is determined by the number of voltage multiplying stages affected by the variable impedance and bypassed within the multiplier by a unidirectional current conducting device.

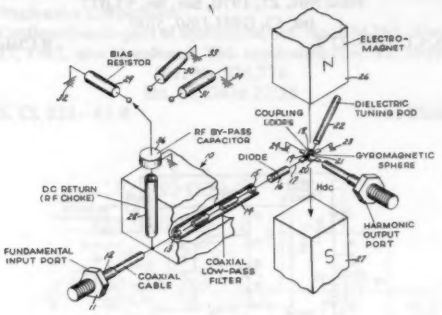
3,646,426

ELECTRONICALLY TUNABLE MICROWAVE FREQUENCY MULTIPLIER

Morris Cohen, Oceanside, N.Y., assignor to Loral Corporation, Scarsdale, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,668
Int. Cl. H02m *5/06;* **H03f** *7/00*
U.S. Cl. 321—69 NL **3 Claims**

An electronically tunable microwave frequency multiplier capable of operating over octave frequency bands in second, third and fourth harmonic modes to yield a continuous output over a desired range. The device includes a fixed coaxial low-pass filter designed to cut off at the highest fundamental frequency, a point contact diode to generate the harmonics, an electronically tuned garnet filter used to tune to the desired harmonic which is then emitted from an output port,



and a DC return fed through an RF bypass capacitor and out to a series of resistors used to effect an optimum self-bias on the diode for the optimum conversion loss for the desired harmonic band.

ERRATUM

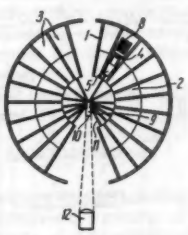
For Class 323—21 see:
Patent No. 3,646,439

3,646,427

HIGH-VOLTAGE LIGHT-CONTROLLED SEMICONDUCTOR CONVERTER

Alexandr Deomidovich Koval, Belyaevo-Bogorodskoe, kvartal 48, korpus 17, kv. 41, and Viktor Iosifovich Eremin, Gospitainy val, 3, kv. 86, both of Moscow, U.S.S.R.

Filed June 2, 1970, Ser. No. 42,707
Claims priority, application U.S.S.R., June 6, 1969, 1335560; Mar. 18, 1970, 1407851
Int. Cl. H02m *1/08*
U.S. Cl. 323—21 **4 Claims**



A high-voltage light-controlled semiconductor converter comprising semiconductor rectifying elements with light pickups, arranged all the way around a sphere, and a light-distributing system placed inside said sphere, for the best utilization of its luminous flux.

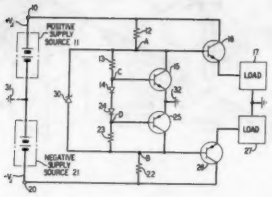
The converter is mainly intended for use on power transmission lines.

3,646,428

SYMMETRICAL VOLTAGE REGULATOR

Gabor Peter Torok, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 27, 1970, Ser. No. 93,077
Int. Cl. G05f 1/60, 5/00
U.S. Cl. 323—22 T 8 Claims



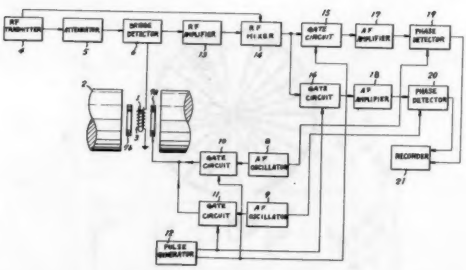
Positive and negative voltage sources are connected to a conventional regulator which establishes a fixed voltage. A sensing circuit utilizing two transistors of opposite polarity monitors the fixed voltage and initiates conduction of one of the transistors in response to an imbalance between the amplitudes of the supply voltages with respect to ground or to a similar imbalance of the load. This causes additional current to flow from one of the supplies, thereby compensating for the imbalance and establishing symmetry with respect to the ground potential.

3,646,429

NUCLEAR MAGNETIC RESONANCE SPECTROMETER

Makoto Takeuchi; Kazuo Nakagawa; Teruo Miyamae, and Terubumi Kase, all of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1969, Ser. No. 888,374
Claims priority, application Japan, Nov. 27, 1969, 44/95300
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 6 Claims



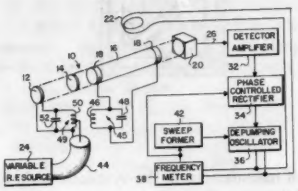
Method and apparatus for measuring gyromagnetic resonances over the nuclear magnetic resonance spectrum wherein the driving ratio frequency magnetic field or the unidirectional polarizing magnetic field is modulated at two or more different frequencies creating different resonance regions on the spectrum which are observed substantially simultaneously.

3,646,430

OPTICALLY PUMPED MAGNETOMETER INCLUDING CIRCUITS FOR ENERGIZING THE RADIATION SOURCE AND THE ABSORPTION CELL

Daniel P. Hearn, Tulsa, Okla., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Oct. 15, 1968, Ser. No. 767,657
Int. Cl. G01r 33/08
U.S. Cl. 324—0.5 11 Claims



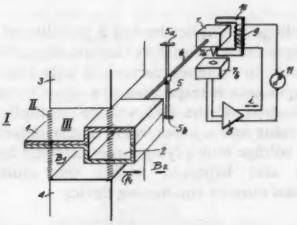
An optically pumped magnetometer comprising a radiation source including a radiation lamp, a radiation absorption cell on one side of the radiation source, a radiation detector, means for subjecting the absorption cell to a high-frequency magnetic field, first coupling means having a first resonant frequency for coupling the absorption cell to a high-frequency source, second coupling means having a second, variable resonant frequency for coupling the radiation source to the high-frequency source, a radiation reflector on the side of the lamp opposite the absorption cell to reflect to the cell radiation initially radiated away from the cell, and a heat sink for the radiation source.

3,646,431

APPARATUS FOR MEASURING THE CONCENTRATION IN PARAMAGNETIC GAS OF A GAS MIXTURE

Sylvain Jean Janssen, Neuilly-sur-Seine, France, assignor to Compagnie Des Compteurs, Paris, France

Filed Oct. 24, 1969, Ser. No. 869,258
Claims priority, application France, Oct. 31, 1968, 172128
Int. Cl. G01r 33/12
U.S. Cl. 324—36 8 Claims

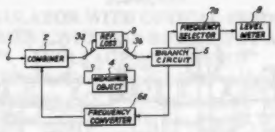


Device for measuring the paramagnetic gas concentration of a gas mixture, constituted by a pick up of general flat shape placed perpendicularly to the electric fluxes of a magnetic field having abrupt intensity variations, said pick up comprising at least one member composed of a flat metal part and an adjacent closed cell-shaped metal part filled with a nonparamagnetic gas or put under a vacuum, connected to the preceding part in a region of the airgap where the induction is uniform, each of these parts respectively having equivalent sections of metal in the regions where the field intensity varies abruptly.

3,646,432
SYSTEM FOR MEASURING THE LOSS OR GAIN COEFFICIENT OF A TRANSMISSION MEDIUM

Taiichiro Nakai, Fujisawa; Hiroshi Sakaki; Masanori Sato, both of Tokyo, and Hiroshi Yuguchi, Yokohama, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed May 14, 1970, Ser. No. 37,236
Int. Cl. G01n 27/00
U.S. Cl. 324—57 R 6 Claims

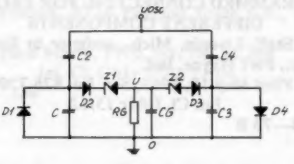


A system for measuring the infinitesimal transmission coefficient of a transmission medium in which a measuring signal is repeatedly passed through the transmission medium, such as a cable or the like, so that the infinitesimal transmission coefficient of the transmission medium is magnified in proportion to the number of repeating cycles of the measuring signal in the transmission medium up to a value sufficient to be readily and precisely measured.

3,646,433
CIRCUIT FOR COMPARING THE CAPACITANCE OF CAPACITANCE ELEMENTS

Nils Aage Juul Eilersen, Gongehusvej, 226-232, DK-2950, Vedboek, Denmark

Filed Apr. 20, 1970, Ser. No. 30,164
Claims priority, application Denmark, Apr. 21, 1969, 2157/69
Int. Cl. G01r 11/52, 27/26
U.S. Cl. 324—60 5 Claims

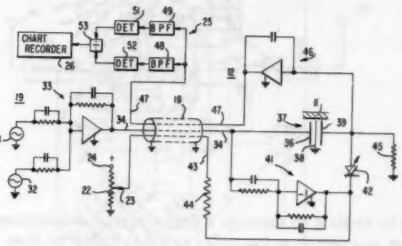


In a circuit for capacitance measurement, particularly for comparison of capacity values, a principal capacitor and a reference capacitor, each in series with an auxiliary capacitor, are connected between the terminals of an AC source. The principal capacitor and the reference capacitor are each shunted by two voltage limiting rectifier couplings, and a pair of such couplings, belonging to the principal capacitor and the reference capacitor respectively and having opposite directions of conduction, are completed through a common load. Preferably, said rectifier couplings may comprise diode rectifiers, and some or all of them may additionally comprise Zener diodes.

3,646,434
STANDARDIZATION OF DIELECTRIC MATERIALS GAUGES HAVING CAPACITIVE PROBES WITH REMOTELY CONTROLLED BALANCING CIRCUITS USING VARACTORS

Alan Norwich, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Continuation-in-part of application Ser. No. 634,261, Apr. 27, 1967, now abandoned. This application Nov. 12, 1969, Ser. No. 875,776
Int. Cl. G01n 27/26
U.S. Cl. 324—61 R 41 Claims



Disclosed is a system for measuring moisture content of a sample with a capacitive probe wherein a voltage controlled, semiconductor capacitor is employed for balancing out the probe capacitance when the probe is removed from the sample. The amount of unbalance produced by the presence of the sample is used as a measure of the moisture content. The probe, capacitor and a phase inverting means are mounted in a head positioned in proximity to the sample. At a remote location from the head and sample, AC and DC power sources are provided for exciting the probe and controlling the capacity of the variable capacity semiconductor, respectively. Monitoring means for variable signals derived from the capacitance measuring means is provided. Balance is attained manually or automatically, according to different embodiments. In automatic balancing, the probe output is modulated with a predetermined frequency which is phase detected to control the amplitude of the voltage applied to the semiconductor capacitor.

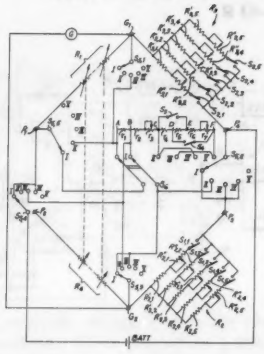
3,646,435
WHEATSTONE-THOMSON COMBINED ELECTRICAL MEASURING BRIDGE

Eliokim Zelikovich Rozenson, ul. Klinichevskaya, 1512, kv. 2, and Gennady Kuzmich Datchenko, Ofitserskaya, 48a, kv. 69, both of Krasnodar, U.S.S.R.

Continuation-in-part of application Ser. No. 674,796, Oct. 12, 1967, now abandoned. This application June 8, 1970, Ser. No. 44,145
Int. Cl. G01r 27/02
U.S. Cl. 324—62 B 7 Claims

A Thomson-Wheatstone bridge including main and auxiliary adjustable arms comprising a number of decade units, the resistances of the ranks of different decade units having a relationship of 1:1, 1:10, 1:100, 1:1,000 and so forth and two adjustable ratio arms each of which consists of a plurality of parallel connected circuits each incorporating a nonadjustable resistor, an adjustable resistor and a switch, the resistors of the parallel circuits being in a relationship with the resistor of any decade unit of the adjustable bridge arms such as 1:1, 1:10, 1:100, 1:1,000, and so forth. With a view toward minimizing reading errors due to deviations of ambient temperature either from a narrow temperature, range or from a strictly fixed temperature, as well as due to instability of

bridge arm resistors with time, comprises a standard of resistance ratio unit consisting of a plurality of series-connected sections incorporating nonadjustable and adjustable resistors, with the resistances of the sections being approximately in a relationship to one another such as $1:1:3:3:3:(3\cdot10):(3\cdot10):(3\cdot10):(3\cdot10^2):(3\cdot10^2):(3\cdot10^2):(3\cdot10^3):(3\cdot10^3):(3\cdot10^3):\ldots\ldots:(3\cdot10^m):(3\cdot10^m):(3\cdot10^m)$, where m is a positive integer, switches are used which provide parallel connections between three of the above-mentioned sections



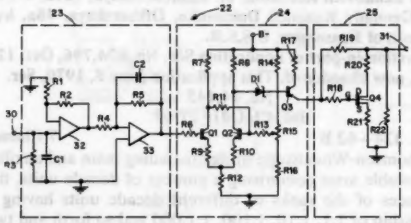
whose resistances are in a relationship of 1:1:1 to obtain a reference ratio of the resistance of the first section of said standard of resistance ratio unit to total resistance of the other sections of said standard of resistance ratio unit, said reference ratio being equal to $1:10^n$, wherein n is an integer or zero. After tuning said standard of resistance ratio unit in the circuit of the Thomson-Wheatstone bridge whose component members are so interconnected as to form the Wheatstone bridge, the Thomson-Wheatstone bridge is reconstituted for measurement.

3,646,436

APPARATUS AND METHOD FOR MEASURING ELECTRICAL RESISTANCE EMPLOYING CONSTANT OUTPUT VOLTAGE TECHNIQUE

Joseph Y. Chan, Chelmsford, and Dinesh C. Gupta, Cambridge, both of Mass., assignors to GTE Laboratories Incorporated

Filed Dec. 22, 1969, Ser. No. 886,974
Int. Cl. G01r *27/14*
U.S. Cl. 324—64 **4 Claims**



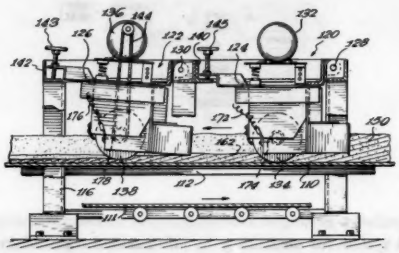
Technique of measuring resistivity of a specimen by contacting the specimen with a pair of electrodes and passing a constant current from a constant current source through the specimen between the electrodes. The potential drop between the electrodes is detected and employed to control the output of the constant current source so as to produce a potential drop between the electrodes of a predetermined value. The measured constant current from the source which produces the predetermined potential drop is a measure of the resistivity of the specimen between the pair of electrodes.

3,646,437

SAND MOISTURE DETECTOR INCLUDING A PLOW NOSE HOUSING AND ROLLER ELECTRODE

Orville C. Nutter, 314 Ingalton, West Chicago, Ill.

Filed Sept. 21, 1970, Ser. No. 73,709
Int. Cl. G01n *27/02*
U.S. Cl. 324—65 R **19 Claims**



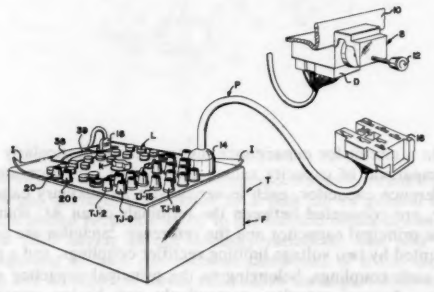
Apparatus is provided for use in a moisture control system which responds to the conductivity of foundry sand disposed between two locations along a reach of a conveyor belt carrying a quantity of foundry sand. At each location there is a device which includes a plow for shaping the sand into a layer or swath of uniform thickness and a rotary electrode which rides in the layer, rotating with the movement of the layer past it. Rotation is achieved either by driving the rotary electrode by an electric motor, or by having the electrode ride on the reach and be driven by the passing belt. Scraper blades keep the exposed surfaces of the rotary electrodes free of adhering sand. The electrodes are mounted at a station which provides means for supporting the electrodes and moving them into position.

3,646,438

APPARATUS FOR TESTING DIFFERENT KINDS OF ELECTROMECHANICAL COMPONENTS USING PREPROGRAMMED CONNECTING FOR EACH OF THE DIFFERENT COMPONENTS

Richard S. Staff, Livonia, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed May 19, 1969, Ser. No. 825,720
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 R **3 Claims**



Indicating test apparatus for testing any one of a selected number of electrical components and comprising an indicating test unit having a plurality of electrically operable indica-

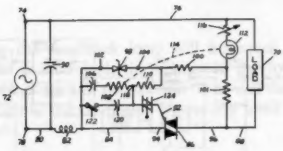
tor means to provide an indication of proper circuit operation. The indicator means are adapted for connection with the selected component by means of interchangeable programmed connector means including a disconnect peculiar to the component being tested and a connector for removably connecting the disconnect means with the indicator means. Interchangeable overlays corresponding to the interchangeable programmed connectors and having indicia thereon peculiar to the selected component may be provided. Means may also be provided to vary the test unit's output voltage which is measured by a voltmeter.

3,646,439

REGULATOR WITH OPTICAL FEEDBACK ARRANGEMENT WHEREIN BOTH INPUT AND OUTPUT VOLTAGE ARE SENSED

Thomas J. Broski, Fort Wayne, Ind., assignor to General Electric Company

Filed July 21, 1970, Ser. No. 56,779
Int. Cl. G05f *1/44, 5/00*
U.S. Cl. 323—21 **9 Claims**



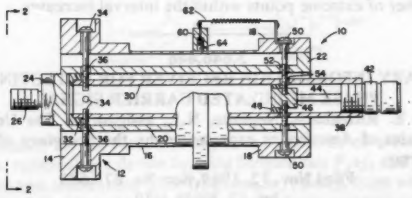
An alternating current phase control regulator circuit for controlling the energization of a load from an alternating current supply. A feedback arrangement is provided which senses in each half-cycle of the supply voltage, both the output voltage of the regulator, as supplied to the load, and the input voltage of the regulator, as supplied by alternating current supply, to provide feedback signal indicative of both the input and output voltages. The regulator which is energized by the alternating current supply includes a ramp and pedestal amplifier which amplifies the feedback signal to provide a firing signal to a bilateral semiconductor switch which phase controls the energization of the load.

3,646,440

TRIMMABLE PULSE CURRENT-VIEWING SHUNT

Francis A. Wilhelm, 8728 Edgehill Drive S.E., Huntsville, Ala.

Filed May 4, 1970, Ser. No. 34,289
Int. Cl. G01r *1/20, 21/04*
U.S. Cl. 324—126 **3 Claims**



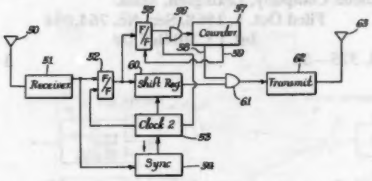
An externally trimmable pulse current-viewing shunt for measuring high peak, fast rising current pulses. The shunt is a tubular, noninductive, four terminal resistance standard. A measurement voltage drop is developed across a thin tubular section of the shunt outer shell. An insulated inner sleeve is connected across the measurement section for coaxial coupling of instantaneous voltages to low-voltage monitor stations, for indicating the precise high-current passing through the measurement section. Precision measurements are additionally afforded by adjusting a slider on the measurement section.

3,646,441

DIGITAL RADIO COMMUNICATION SYSTEMS USING REPEATERS OPERATING AT SAME FREQUENCY

Henry Magnuski, 605 Spring Road, Glenview, Ill.

Filed Dec. 5, 1969, Ser. No. 882,414
Int. Cl. H04b *7/18*
U.S. Cl. 325—13 **23 Claims**



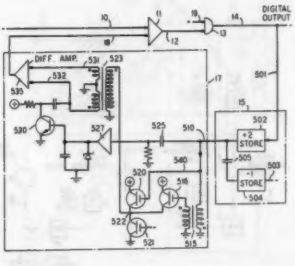
Communication systems using a repeater or a chain of repeaters each of which receives information during one portion of a cycle of operation and transmits at the same frequency during a subsequent portion of the cycle in a manner to avoid interference. Digital circuitry is provided for transmitting, repeating and receiving digital signals in a manner such that no information is lost and good spectrum utilization and high fidelity are achieved without compounding distortion and noise effects, permitting use of a large number of relatively low-power repeaters. Delta modulator and demodulator means are provided for converting voice or other analog signals to digital signals and for reconverting the digital signals to analog signals. Radio waves of one frequency can be used and a mobile unit can be moved from the field of a base unit to that of a repeater or from the field of one repeater to that of another, without interruption in communication.

3,646,442

DELTA MODULATION SYSTEM USING VARIABLE WEIGHTED QUANTA TO OVERCOME SLOPE LIMITATIONS

Robert Alan Kotch, Villa Park, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 781,852, Dec. 6, 1968, now abandoned. This application Apr. 30, 1970, Ser. No. 33,392
Int. Cl. H03k *13/22*
U.S. Cl. 325—38 B **9 Claims**



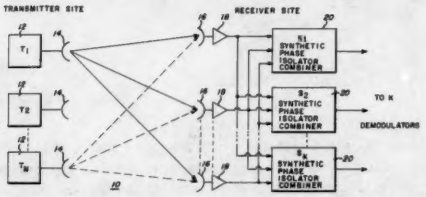
A delta modulation system is disclosed in which the input signal is compared with a reference level derived from the integrated output signal, the comparison resultant modulating a pulse train to produce the delta output signal in the conven-

tional manner. The magnitude of the reference level is determined by superimposing the absolute magnitude of the integrator output on a fixed reference voltage level and utilizing the resultant voltage together with the sign of the integrator output to produce the reference level for the waveform reconstruction.

3,646,443
MULTIAPERTURE RECEIVING AND TRANSMITTING SYSTEM

William J. Bickford, Weston; Joseph T. De Bettencourt, West Newton; James F. Roche, Dedham, and Howard J. Rowland, Newton Highlands, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 1, 1968, Ser. No. 764,094
Int. Cl. H04b *7/04*
U.S. Cl. 325—56 **3 Claims**

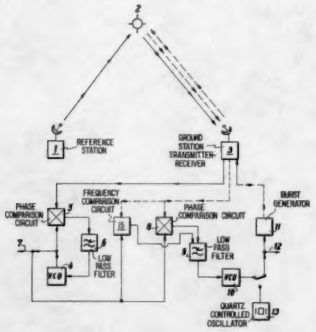


A multiaperture receiving and transmitting system using predetection signal combining which provides the same aperture with a multielement antenna system as will the use of a single large aperture. The multiplicity of apertures for the transmitter permits multiplexing of RF carriers side-by-side in the same radio channel assignment. In the receiver portions of the system with N apertures and one transmitter per aperture, predetection combining permits reception of each signal on N apertures.

3,646,444
METHOD AND APPARATUS FOR SYNCHRONIZING THE TRANSMISSION OF DIGITAL SIGNALS BETWEEN GROUND STATIONS VIA A COMMUNICATIONS SATELLITE

Wolfgang Bitzer, Unterweissach, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

Filed Oct. 8, 1969, Ser. No. 864,818
Claims priority, application Germany, Oct. 16, 1968, P 18 03 263.8; Feb. 5, 1969, P 19 05 532.4
Int. Cl. H04b *1/40*
U.S. Cl. 325—58 **15 Claims**

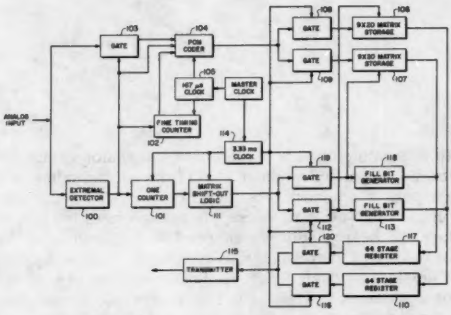


A method and apparatus for synchronizing the transmission of data between a plurality of ground stations via a satellite by transmitting a fixed frequency reference signal from a reference ground station, receiving this signal at every other ground station, producing at each other ground station a first local signal identical in frequency and phase with the received reference signal, producing at each other ground station a second local signal, transmitting this signal to the satellite and receiving this signal back at the ground station from which it originated, and varying the second local signal until it has a value such that upon its reception back at the originating station it is identical in frequency and phase with the first local signal produced at that station.

3,646,445
ADAPTIVE EXTREMAL CODING OF ANALOG SIGNALS

Adolf Reindl, Asbury Park, N.J., assignor to The United States of America as represented by the Secretary of the Army

Continuation-in-part of application Ser. No. 628,510, Apr. 4, 1967. This application Oct. 2, 1970, Ser. No. 77,460
Int. Cl. H04b *1/04*
U.S. Cl. 325—141 **4 Claims**



A method of transmitting extreme point samples of an analog waveform is described in which the signal is processed in intervals of a fixed number of bits. During each interval a heading is transmitted indicating in which of the plurality of frames within the interval the extreme points lie. The remainder of the interval comprises the extreme point data plus a variable number of fill-bits. The extreme point data comprises amplitude and fine timing data. The number of encoding levels of the extreme point data decreases as the number of extreme points within the interval increases.

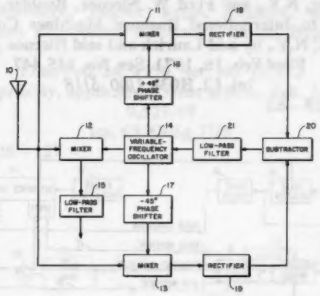
3,646,446
BINARY INFORMATION RECEIVER FOR DETECTING A PHASE MODULATED CARRIER SIGNAL

Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 12, 1969, Ser. No. 875,682
Int. Cl. H04b *1/30*
U.S. Cl. 325—320 **4 Claims**

A receiver for detecting phase reversed binary information wherein the phase reversal is accomplished linearly over one clock period by slightly increasing or decreasing the carrier frequency. A variable frequency local oscillator tuned to the carrier frequency is mixed with the phase modulated carrier signal and then averaged by a first filter. When the oscillator is at the proper phase, the output of the first filter will be a binary signal. A pair of feedback loops detect and compare

in a subtractor and a second filter the rectified outputs of a pair of mixers which beat the phase modulated carrier signal with plus and minus 45° components of the oscillator signal. When the oscillator is at the proper phase, the energy from



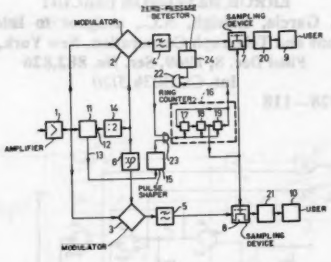
both mixers in the feedback loop will be equal. When the oscillator phase is incorrect, the energy in the loops will be different and the output of the second filter will then increase or decrease slightly the oscillator frequency until the proper phase is reached.

3,646,447

RECEIVER FOR RECEPTION OF MODULATED PULSES LYING IN A GIVEN SIGNAL BAND

Petrus Josephus Van Gerwen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,636
Claims priority, application Netherlands, Nov. 4, 1969, 6916580
Int. Cl. H04b 1/18; H03k 9/00
U.S. Cl. 325—321 **1 Claim**



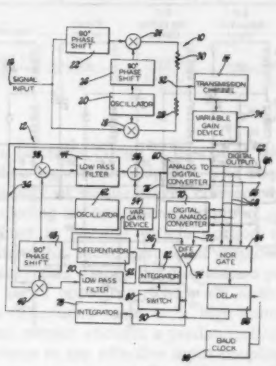
Receiver for the reception of pulses modulated on a carrier wave, comprising a device forming frequencies F_1+f_2 and f_1-f_2 from two transmitted pilot frequencies f_1 and f_2 from which the local carrier and clock signals respectively are derived. In order to reduce the phase shifts of these signals due to frequency shifts on the transmission path, the device comprises two automatic phase correction (AFC)-loops each including a phase discriminator and an oscillator, the incoming signals being applied to the phase discriminator of the first AFC-loop and the associated oscillator being tuned to f_1 or f_2, while the output voltage of said phase discriminator is applied both to the phase discriminator of the second AFC-loop whose oscillator is tuned to f_1+f_2 and to a selective circuit tuned to f_1-f_2.

3,646,448

QUADRATURE INJECTION CONTROL CIRCUIT

Samuel T. Harmon, Jr., and Kenneth E. Monroe, both of Ann Arbor, Mich., assignors to Datamax Corporation, Ann Arbor, Mich.

Filed Feb. 16, 1970, Ser. No. 11,379
Int. Cl. H04b 1/16
U.S. Cl. 325—326 **12 Claims**



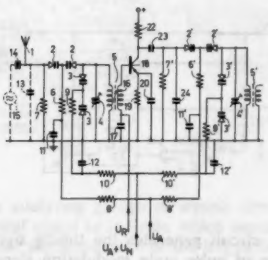
A data signal communication system including an analog signal transmitter and a receiver for converting the analog signal levels to digital form. The receiver employs an automatic gain control loop including means for generating an error signal related to the difference between the analog input and the analog equivalent of a digital output. The error signal is used to control both loop gain and the quantity of a quadrature component which is combined with the data signal within the automatic gain control loop.

3,646,449

INPUT STAGE FOR A RECEIVER, PARTICULARLY FOR THE MEDIUM WAVE

Heinz Hellbarth, Wetzlar; Wolfram Wendel, Niederbiel, and Alfred Schulz, Volpertshausen, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1970, Ser. No. 30,432
Claims priority, application Germany, Apr. 22, 1969, P 19 19 625.9
Int. Cl. H04b 1/18
U.S. Cl. 325—383 **10 Claims**

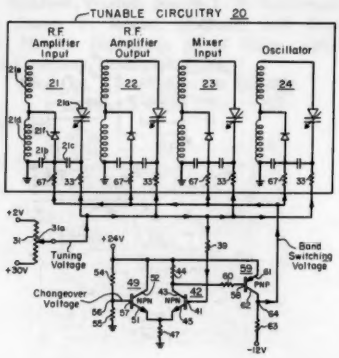


A receiver input stage for the reception of signals in a broad frequency range comprising an input resonant circuit and an output resonant circuit that is identical to the antenna-input circuit. The input and output circuits are coupled and tuned by means of variable capacity coupling and tuning diodes respectively.

3,646,450
VOLTAGE-CONTROLLED PLURAL-BAND TUNER FOR A WAVE SIGNAL RECEIVER

John Y. Ma, Algonquin, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 13, 1969, Ser. No. 849,837
Int. Cl. H04b 1/16
U.S. Cl. 325—458 7 Claims

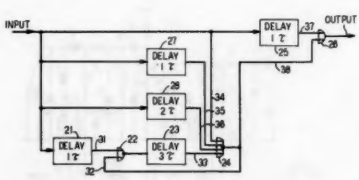


Selective tuning to any broadcast channel within a plurality of frequency bands is achieved by voltage-controlled tunable circuitry, such as the type employing varactor or varicap diodes, responsive to an adjustable DC tuning voltage, having unique levels assigned to the various desired channels. The voltage level, in tuning across all of the frequency bands, must be varied over a predetermined amplitude range, portions of which range are effectively assigned to different respective ones of the bands. Band switching of the tunable circuitry occurs automatically and electronically under control of the tuning voltage. Each time its amplitude is changed from a level in one portion of the range to a level in another portion, the tuner is made tunable over a different frequency band. No mechanical switches are needed to accomplish band switching.

3,646,451
TIMING EXTRACTION CIRCUIT USING A RECIRCULATING DELAY GENERATOR

Stephen Davis Shoap, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 7, 1970, Ser. No. 62,014
Int. Cl. H04l 25/66
U.S. Cl. 328—63 5 Claims

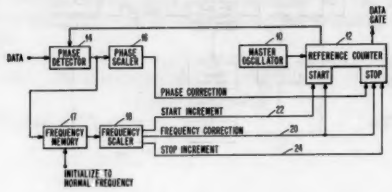


A timing circuit generates the timing signal used in the regeneration of pulse code modulation signals by taking a previously regenerated signal and inserting pulses where they are missing from the original signal. The inserted pulses are created in a recirculating delay generator which is synchronized with the incoming data and whose outputs is inhibited by delaying the input pulses for various periods and applying them to the output gate of the generator so that an output pulse from the generator is available only when there is no input pulse. The output of the generator is then summed at the output gate of the circuit with the original signal, producing a continuous stream of timing pulses.

3,646,452
SECOND ORDER DIGITAL PHASE-LOCK LOOP

Isaac Horowitz, Rehovot, Israel; Lawrence A. Laurich, Mahopac, N.Y., and Fred W. Niccone, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y., by said Laurich and said Niccone

Filed Feb. 16, 1971, Ser. No. 115,447
Int. Cl. H03k 1/00, 5/18
U.S. Cl. 328—63 10 Claims

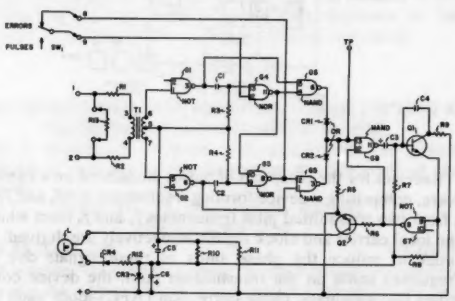


A digital second order phase-lock loop is built up utilizing all-digital circuits. The purpose of the loop is to synchronize a data gate signal in the synchronous data receiver with an incoming train of data pulses. One application of the system is the production of gate signals synchronized with data pulses read from a magnetic recording. The loop consists of six basic parts: (1) a reference counter with controllable start and stop counts; (2) a master oscillator to advance the reference counter; (3) a phase detector to detect the phase difference between a data pulse and the digital ramp simulated by the advancing count in the reference counter; (4) a phase scaler for generating an immediate phase correction factor for the reference counter; (5) a frequency memory which is updated and thereby tracks the frequency of the data pulses; and (6) a frequency scaler for generating an immediate and continuing frequency correction for the reference counter. The loop symmetrically corrects the digital ramp simulated by the reference counter.

3,646,453
ERROR DETECTOR CIRCUIT

Julian A. Garcia, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 8, 1969, Ser. No. 882,826
Int. Cl. H03k 5/20
U.S. Cl. 328—118 4 Claims



An electronic detector circuit is provided for use in determining whether or not a bipolar train of pulses is being received, where a bipolar train of pulses is one in which successive pulses are of opposite polarity. The circuit also includes the capability of distinguishing errors in bipolar pulse

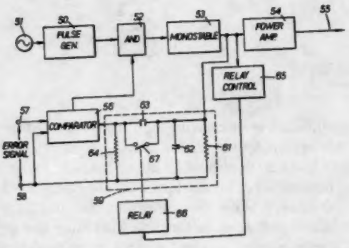
trains where an error exists when two successive pulses are of the same polarity.

3,646,454

CONTROL SYSTEMS HAVING PROPORTIONAL AND INTEGRAL CONTROL

Michael Southern, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, Bognor Regis, England

Filed Feb. 24, 1970, Ser. No. 13,572
Claims priority, application Great Britain, Feb. 24, 1969, 9,829/69
Int. Cl. G06g 7/18
U.S. Cl. 328—127 7 Claims



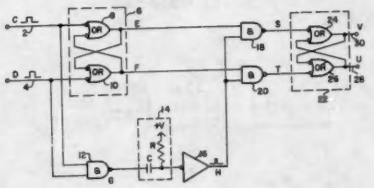
In a control system having a controller providing an output control signal with at least proportional and integral components, means are provided operative when the output signal reaches a predetermined value to inhibit operation of the integrating means until the control is back within the proportional band so as thereby to prevent integral saturation.

3,646,455

PHASE-DETECTING CIRCUIT

Edmund G. Coccagna, Villanova, Pa., assignor to Mohawk Data Sciences Corporation, Herkimer, N.Y.

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,232
Int. Cl. H03d 13/00
U.S. Cl. 328—133 6 Claims



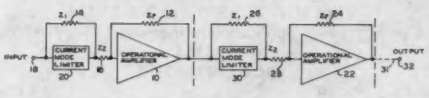
A circuit for detecting which of two out-of-phase input signals is leading (or lagging) the other. The detecting circuit includes a first circuit which is bistable for certain periods of time, the state of this circuit during each such period being dependent on which signal is leading. A timing pulse is provided during each such period and fed to a bistable circuit which provides the output signal of the detecting circuit. The bistable circuit is adapted to respond to the state of the first circuit in response to the timing pulses and, thereby, provides an output signal indicative of which of the two input signals is leading or lagging.

3,646,456

LOGARITHMIC AMPLIFIER

Eugene C. Kauffman, Portland, and Larry R. Lockwood, McMinnville, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed July 9, 1970, Ser. No. 53,466
Int. Cl. G06g 7/24
U.S. Cl. 328—145 11 Claims



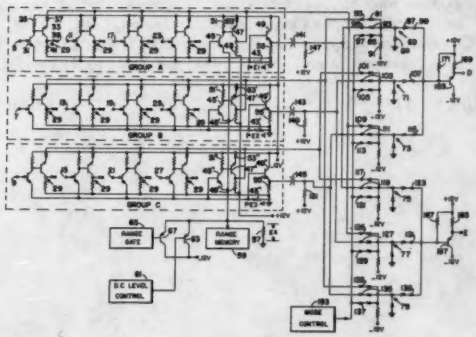
A nonlinear amplifier circuit is described which may be used to provide a logarithmic amplifier. The amplifier circuit includes a plurality of similar stages connected in cascade, each stage including an operational amplifier and a limiter circuit connected in parallel with a portion of the input coupling resistance of such operational amplifier. The limit circuit is current-mode actuated and includes a pair of diodes connected in series opposition which are switched from a quiescent low-impedance state to a high-impedance state when the signal current exceeds a predetermined level. This causes an increase in the effective input coupling resistance and thereby reduces the gain Z_f/Z_{in} of the operational amplifier stage to unity. As a result of cascade amplification, five amplifier stages are switched to unity gain in successive order from the output to the input of the amplifier circuit, thereby forming each of the segments of the logarithmic output.

3,646,457

HIGH SPEED GREATEST OF COMPARATOR CIRCUIT

Charles E. David, Huntsville, and Wallace E. Wood, Arab, both of Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 6, 1965, Ser. No. 493,589
Int. Cl. H03k 5/20
U.S. Cl. 328—147 5 Claims



A device for analyzing groups of signals simultaneously, providing a digital signal to indicate which signal is the largest, and produce the amplitudes of the largest inputs in the other groups. The signals in a particular group are fed to a parallel combination of transistors. The largest signal in a group causes its transistor to conduct and thereby back-bias all other transistors. A plurality of groups are likewise connected so that the largest signal from any group is presented at a particular output. The largest signals from the other groups produce outputs which are fed to inhibit gates (AND gates) along with other outputs from the groups to control

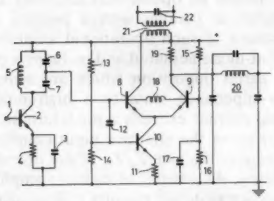
output transistors so that their output is the same as the second and third largest input signals.

3,646,458

CIRCUIT ARRANGEMENT FOR DETECTING A TELEVISION SIGNAL HAVING A DIFFERENTIAL CIRCUIT WITH A COMMON EMITTER TRANSISTOR

Leonardus Adrianus Johannes Verhoeven, and Hendrikus Dollekamp, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1970, Ser. No. 23,326
Claims priority, application Netherlands, Apr. 5, 1969, 6905354
Int. Cl. H03d 3/18
U.S. Cl. 329—50 **5 Claims**



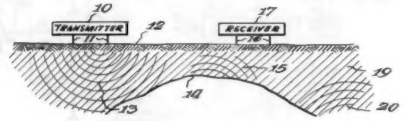
A video detector circuit comprising a long-tailed pair arrangement employing a first and a second transistor and a third transistor in the common emitter of the first and the second transistor, the third transistor being linearly controlled by the signal to be detected and the first and second transistors being switched by the same signal.

3,646,459

INDUCED POLARIZATION RECEIVER

Theodore R. Madden, Weston; George H. Hopkins, Jr., Boston, and Michael Chessman, Watertown, all of Mass., assignors to Ampex Corporation, San Mateo, Calif.

Continuation of application Ser. No. 810,067, Jan. 27, 1969. This application Feb. 26, 1971, Ser. No. 119,412
Int. Cl. H03d 3/18
U.S. Cl. 329—50 **7 Claims**



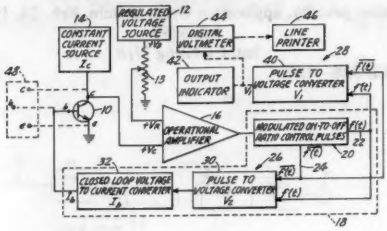
A receiver for measuring the subsurface electrical impedance of the earth as indicated by the frequency dependent attenuation of low-frequency transmitted signals. The receiver has a gain control for establishing a reference gain level at one frequency and an indicator for the signal amplitude deviation at a second frequency. A synchronous detector controlled by the output of a local oscillator synchronized with the received signal permits operation under poor signal-to-noise conditions.

3,646,460

MODULATED ON-TO-OFF RATIO PULSE CONTROLLED DIGITAL-TO-ANALOG CONVERTER

Daniel J. Donohoo, Shoreview, Minn., assignor to Dantronics Inc., St. Paul, Minn.

Filed Nov. 13, 1969, Ser. No. 876,488
Int. Cl. H03k 9/08
U.S. Cl. 329—102 **12 Claims**



An amplification-measuring apparatus for determining amplification of an active device having a control input and a controlled output is shown. The apparatus includes a regulated voltage source, a constant current source for operating the active device while the amplification measurements are being made thereon, a difference amplifier for producing a control signal having at least a predetermined magnitude, a converting means for producing an input signal in response to the control signal, which input signal is applied to the control input for operating the active device, and an analog signal-producing means which converts the control signal into an analog signal representing the amplification of the active device.

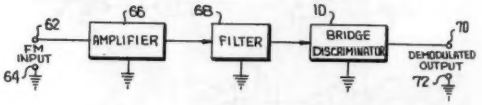
Also disclosed is an output-indicating means which is responsive to the analog signal for directly representing as a visual readout the amplification of the active device. In addition, a control means and a modulated on-to-off ratio control pulse generator are disclosed which are adapted for use in said amplification measuring device.

3,646,461

REDUCED DISTORTION DRIVING OF BALANCED TRANSMISSION LINE PHASE BRIDGE DISCRIMINATORS

Richard Modafferi, Vestal, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,768
Int. Cl. H03d 3/00
U.S. Cl. 329—192 **7 Claims**



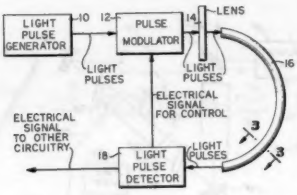
A balanced transmission line phase bridge frequency discriminator of conventional type is driven by a circuit which reduces even order harmonic content of a frequency modulated radio signal, as seen by said discriminator, essentially to zero, and which reduces progressively the amplitudes of odd order harmonics, if these occur, in order to increase the useful demodulated output of the detector. Well balanced push-pull amplifiers employing bifilar windings to enhance balance are employed in one embodiment, to effect the drive; in another embodiment filtering is resorted to to remove harmonic response; and in still another embodiment both these expedients are employed concurrently.

3,646,462

FIBER FOR DISTORTION-FREE PROPAGATION

Elias Snitzer, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 14, 1969, Ser. No. 876,838
Int. Cl. H01s 3/02, 3/08
U.S. Cl. 330—4.3 10 Claims



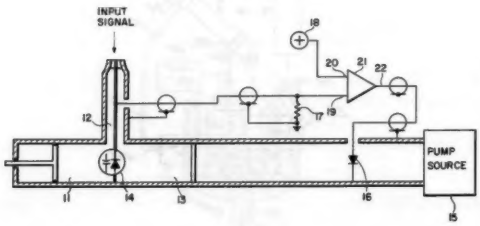
A fiber for use in the propagation of light pulses with the attendant elimination of distortion. The fiber is useful as a delay line storage device for computer information with an extremely high-packing density capability for the bits of information. Another application is in a broadband communication system as a transmission line and in any application the fiber may be "active" as either a laser amplifier or oscillator. Basically, the invention involves the choice of fiber core and cladding size and other parameters to counteract, with the anomalous dispersion associated with the waveguide transmission, the normal dispersion of the bulk glass from which the fiber is made. The pulses of light are thereby propagated undistorted since the various frequency components within the light pulse are propagated with an effective velocity which is independent of wavelength in the spectral interval of the pulse.

3,646,463

GAIN STABILIZED PARAMETRIC DEVICE

Uldis Rutulis, and Edward Stowe Layton, both of Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Nov. 2, 1970, Ser. No. 85,842
Int. Cl. H03f 7/04
U.S. Cl. 330—4.9 3 Claims



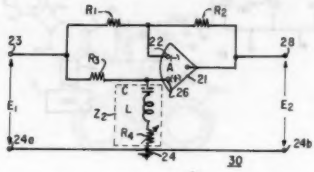
A gain stabilized parametric device having a varactor diode shunted by an external bias resistor to form a self-bias configuration. When pump, input, or pump and input signals are coupled to the varactor diode, through pump and signal circuits respectively, a self-bias voltage develops across the bias resistor. This self-bias voltage is compared to a preset reference voltage to generate a difference voltage which is then amplified and used to control the attenuation of a variable attenuator interposed between the pump source and the pump circuit.

3,646,464

ACTIVE DELAY AND AMPLITUDE EQUALIZERS

Albert Boggs, deceased, late of New York, N.Y. (by Emily Eloise Boggs, Executrix), assignor to Sangamo Electric Company, Springfield, Ill.

Filed Feb. 13, 1970, Ser. No. 11,204
Int. Cl. H03f 1/36
U.S. Cl. 330—30 D 10 Claims



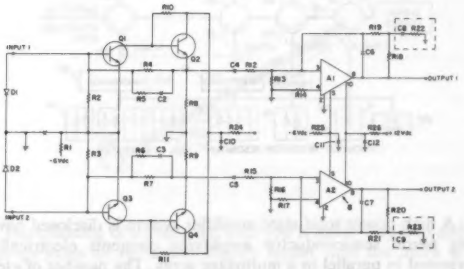
An adjustable active delay and amplitude equalizer circuit, including operational amplifiers, and resistive and reactive circuit elements, in which adjustment for amplitude can be made substantially independent of adjustment for delay.

3,646,465

DUAL WIDEBAND AMPLIFIER

Jerome T. Hartlaub, New Brighton, Minn., assignor to The United States of America as represented by the Secretary of the Army

Filed July 15, 1970, Ser. No. 54,944
Int. Cl. H03f 33/68
U.S. Cl. 330—30 R 1 Claim



A dual amplifier having the capability to amplify extremely low level photodiode transducer output signals to useful voltage levels. The input signals are amplified while input signal phase separation is preserved at the output. Each channel has a first stage for voltage gain, a second stage for high to low impedance transfer with corresponding current gain and an integrated circuit amplifier having a nearly flat voltage gain over the bandwidth. The dual amplifiers are essentially physically overlapping so that the design includes both adequate power supply decoupling and simplicity for easy lead positioning in order to achieve negligible interchannel coupling.

3,646,466

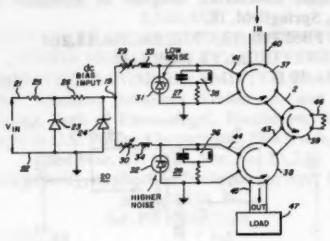
TUNNEL DIODE AMPLIFIER

William J. Crowe, Berkeley Heights, and Robert G. Geissler, Cranford, both of N.J., assignors to Raytheon Company, Lexington, Mass.

Continuation-in-part of application Ser. No. 717,711, Apr. 1, 1968. This application June 4, 1970, Ser. No. 43,494
Int. Cl. H03f 3/10
U.S. Cl. 330—34 15 Claims

An apparatus for minimizing the variation of gain with bias voltage and temperature variations in a tunnel diode

microwave amplifier or other tunnel diode circuit by employing two stages in which one stage is biased at a voltage higher



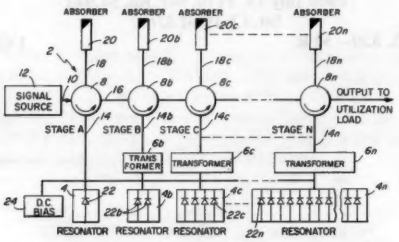
than the peak gain bias voltage and the other stage is biased at a voltage less than the peak gain bias voltage.

3,646,467

SOLID-STATE ELECTROMAGNETIC ENERGY AMPLIFIER SYSTEM

Burton H. Smith, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 2, 1970, Ser. No. 86,172
Int. Cl. H03f *3/60*
U.S. Cl. 330—53 **5 Claims**



A high-power solid-state amplifier system is disclosed having plural semiconductor amplifying elements electrically oriented in parallel in a multistage array. The number of elements in each stage successively increases with all elements operating at substantially the same RF voltage level. The stages are interconnected by circulator transmission means. Two modes of operation are permissible, namely, as a reflection-type amplifier or phase lock oscillator. Suggested amplifying elements include negative resistance semiconductors of the bulk effect or avalanche-type.

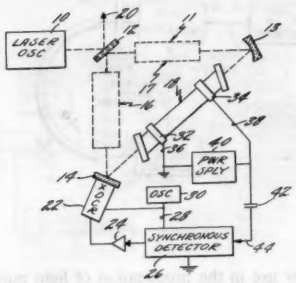
3,646,468

SERVO AIDED INJECTION PHASE-LOCKED LASER OSCILLATOR

Carl J. Buczek, Manchester; Michael L. Skolnick, Monroe, and Robert J. Freiberg, South Windsor, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 20, 1970, Ser. No. 21,319
Int. Cl. H01s *3/00;* **G01b** *9/02*
U.S. Cl. 331—94.5 **5 Claims**

A high-power laser oscillator is overcoupled, thereby to be oscillating at below maximum output power, and laser radiation injected into the high-power oscillator from a low-power, controlled driving oscillator drives the total radiation intensity within the high-power oscillator to an output power approaching its maximum value. This permits the high-power oscillator output to be sharply maximized when it is adjusted so that its resonant frequency is close to that of the driving oscillator, thereby permitting closed loop servocontrol of the high-power oscillator cavity length in response to maximum power output to cause the cavity length to match the transition frequency of the driving oscillator closely enough for



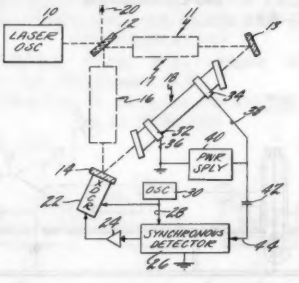
stable phase locking of the two oscillators. In one embodiment, a ring interferometer high-power oscillator is operated in one direction only thereby preventing feedback from this oscillator to the driving (low-power reference) oscillator. In another embodiment, an optical isolator is used between the high low-power reference oscillator and the power oscillator.

3,646,469

TRAVELLING WAVE REGENERATIVE LASER AMPLIFIER

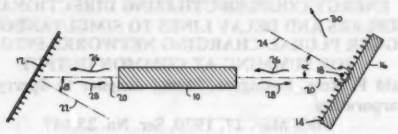
Carl J. Buczek, Manchester, and Michael L. Skolnick, Monroe, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 20, 1970, Ser. No. 21,320
Int. Cl. H01s *3/00;* **G01b** *9/02*
U.S. Cl. 331—94.5 **4 Claims**



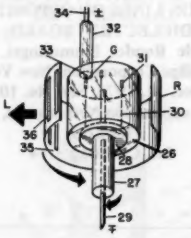
A unidirectional travelling wave regenerative amplifier includes gain medium disposed in a travelling wave ring interferometer, the unidirectional travelling wave permitting coupling of a driving oscillator thereto without the amplifier feeding back to the oscillator. Because the amplifier is operated near saturation intensity, the output characteristic (with respect to frequency) is broadened; therefore, the output power and phase stability are relatively insensitive to variations in physical resonance. A hill climbing servo maintains the cavity of the ring interferometer at a length which relates precisely to the output frequency of the driving oscillator.

3,646,470
STIMULATED RADIATION CAVITY STRUCTURE
David Y. Tseng, 142 Wendy Drive, Newbury Park, Calif.
Filed July 16, 1970, Ser. No. 55,498
Int. Cl. H01s 3/08
U.S. Cl. 331—94.5 6 Claims



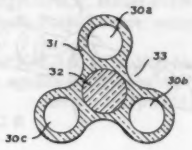
A laser/maser cavity configuration for scanning and amplitude modulating the laser/maser output directly from the cavity reflector. These effects are controlled directly by the cavity reflector; no separate components are required for accomplishing these effects. The scanning and amplitude modulation are obtained by direct angular rotation of one of the cavity reflectors. The rotating reflector is a novel reflection grating that belongs to the class of corrugated structures which exhibit a newly discovered type of Wood anomaly. These corrugated reflection gratings are wavelength selective, power selective and polarization selective according to their structure and angular orientation to the laser/maser cavity. The rotation device may be any system which provides an angular degree of freedom about an axis perpendicular to the longitudinal axis of the cavity. The range of angular scan, the scanning direction, and the level of amplitude modulation are easily calculated from available explicit formulas and graphs.

3,646,471
A CYLINDRICAL ARRAY OF EXPLODING CONDUCTORS EMBEDDED IN A SOLID DIELECTRIC FOR PUMPING A LASER
Jack DeMent, 4847 Southeast Division Street, Portland, Oreg.
Original application Jan. 7, 1963, Ser. No. 254,536, now Patent No. 3,300,734, dated Jan. 24, 1967. Divided and this application Nov. 25, 1966, Ser. No. 597,505
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 2 Claims



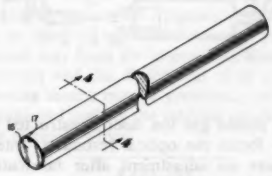
A rotatable phased array of explodable conductors is enstructured with a transparent cylinder of dielectric, blast-resistant solid, each of the explodable conductors fired in sequence by contact with a high-voltage source upon rotation of the cylindrical ensemble of explodable conductors, to sequentially release brilliant bursts of light including laser pumping light.

3,646,472
LASER STRUCTURES
Alfred R. Cooper, Cleveland Heights, Ohio, and Charles Gilbert Young, Storrs, Conn., assignors to American Optical Corporation, Southbridge, Mass.
Filed Oct. 2, 1967, Ser. No. 672,307
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 2 Claims



Laser structures for generating and amplifying laser light, each such structure embodying an elongated core of solid laser material embedded within a cladding of solid light-transmitting material and within which cladding is also embedded a plurality of elongated flashtube chambers arranged in symmetrical relation to said core.

3,646,473
CLAD GLASS LASER ROD
Charles Gilbert Young, Southeast Road, Storrs, Conn.
Filed Apr. 10, 1969, Ser. No. 815,012
Int. Cl. H01s 3/06, 3/16
U.S. Cl. 331—94.5 8 Claims

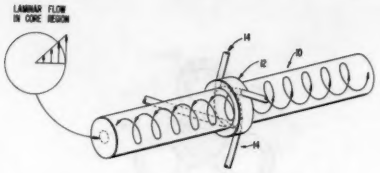


The cladding of a clad glass laser rod is made very thin and has an index of refraction slightly higher than the index of refraction of the laser glass core.

3,646,474
SYMMETRICALLY PUMPED SLAB LASER
Joseph P. Segre, Acton, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 21, 1969, Ser. No. 817,909
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 9 Claims

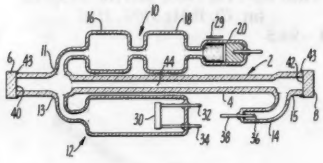
The combination of apparatus for exfocal symmetrically pumping with a generally rectangular slab-type laser. The arrangement is especially suited to substantially overcome problems of birefringence induced by thermal gradients in a laser being pumped.

3,646,475
VORTEX TUBE LASER
Francis M. Taylor, Xenia, Ohio, assignor to Systems Research Laboratories, Inc., Dayton, Ohio
Filed Sept. 16, 1969, Ser. No. 858,491
Int. Cl. H01s 3/09, 3/22; F25b 9/02
U.S. Cl. 331—94.5 9 Claims



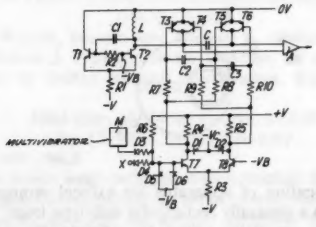
A Hilsch-Ranque swirl tube is operated as a gas laser by injecting a mixture of hot gases therein at very high velocity.

3,646,476
PULSED GAS ION LASER
Gerald C. Barker, Palo Alto, and Steven M. Jarrett, Los Altos, both of Calif., assignors to Coherent Radiation Laboratories
Filed Nov. 24, 1969, Ser. No. 879,154
Int. Cl. H01s 3/09, 3/02, 3/22
U.S. Cl. 331—94.5 5 Claims



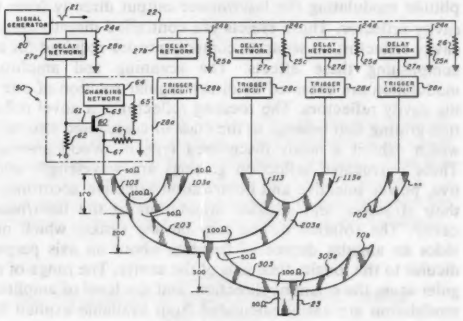
A miniature pulsed gas ion laser constructed so that the discharge tube forms the optical resonator. Internal cavity reflectors require no adjustment after fabrication. TEM_{oo} output is provided at a single wavelength.

3,646,477
MEANS FOR RAPIDLY SWITCHING TUNED CIRCUITS OF VARIABLE-FREQUENCY OSCILLATORS FROM ONE STATE TO ANOTHER
Laurence Goodall, Egham, England, assignor to Ferranti, Limited, Lancashire, England
Filed Jan. 29, 1970, Ser. No. 6,695
Claims priority, application Great Britain, Feb. 1, 1969, 5,558/69
Int. Cl. H03b 5/12
U.S. Cl. 331—117 R 4 Claims



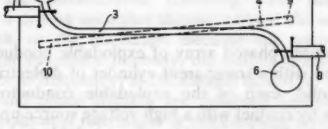
A variable-frequency oscillator includes a tuned circuit and a switch having two positions. In one position the tuned circuit is completed, and in the other position the tuned circuit is interrupted and the energy stored in it remains substantially constant. Switch drive means are provided to either maintain the switch in said one position or to cause it to alternate repetitively between the two positions at a rate considerably greater than the frequency of oscillation of the tuned circuit.

3,646,478
ENERGY COUPLER UTILIZING DIRECTIONAL COUPLERS AND DELAY LINES TO SIMULTANEOUSLY TRIGGER PLURAL CHARGING NETWORKS INTO TREE FOR SUMMING AT COMMON OUTPUT
Gerald F. Ross, Lexington, Mass., assignor to Sperry Rand Corporation
Filed Mar. 27, 1970, Ser. No. 23,147
Int. Cl. H01p 5/12, 3/08; H03k 5/159
U.S. Cl. 307—106 6 Claims



An electromagnetic energy coupling network for reciprocally processing energy flowing in pluralities of transmission lines is disclosed. The network may be employed individually or multiply as a coupling network element in complex coupling network matrices for the generation of subnanosecond signal impulses. The coupling element is a multiple port transmission line junction associated with tapered transmission lines and efficiently transferring energy inputs on such lines into a wave flowing only from a single output port.

3,646,479
DIRECTIONAL COUPLER COMPRISING DIFFERENT TRANSMISSION LINES ON OPPOSITE SIDES OF DIELECTRIC BOARD
Frans Christiaan de Ronde, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 31, 1970, Ser. No. 103,061
Claims priority, application Netherlands, Feb. 14, 1970, 7002118
Int. Cl. H01p 5/14
U.S. Cl. 333—10 1 Claim



A reciprocal directional coupling comprising a strip line provided on a dielectric supporting plate and a gap line pro-

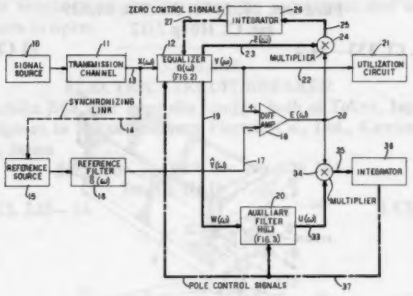
vided on the opposite surface so that the longitudinal axes of the transmission lines cross each other at a small angle so that a wide, effective frequency bandwidth is obtained.

3,646,480

RECURSIVE AUTOMATIC EQUALIZER

David Adams Spaulding, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1970, Ser. No. 101,379
Int. Cl. H04b *3/04*
U.S. Cl. 333—18 **8 Claims**



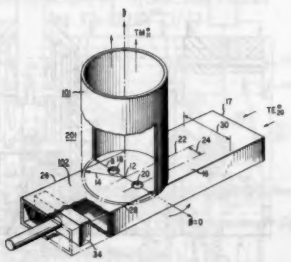
A general-purpose synthesizer or equalizer combining recursive and nonrecursive signal paths automatically compensates a distorting transmission medium in order to achieve a desired overall transfer function (ratio of output to input parameters). Zeros of transmission are adjusted in the equalizer by direct correlation of the error difference between the actual equalizer output and a reference output with a plurality of filtered samples of the distorted signal. Poles are adjusted in parallel paths within the equalizer for each of which paths individual samples are first filtered in a duplicate of the recursive portion of the basic equalizer and correlated with the above error differences. Inputs to the equalizer are furnished in common to each of the parallel paths, which comprises simple second order recursive filters, to realize poles of resonance. The output of the equalizer is composed of signal samples from the several parallel paths to realize transmission zeros.

3,646,481

WAVEGUIDE MODE TRANSDUCER

Chi Fu Den, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1971, Ser. No. 123,673
Int. Cl. H01p *1/16*
U.S. Cl. 333—21 R **10 Claims**



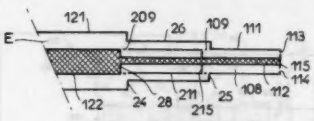
A transducer for converting the TE_{20} rectangular wave mode into the TM_{11} circular wave mode utilizes a circular waveguide capable of supporting the TM_{11} mode which is mounted to a broad side of a rectangular waveguide transmitting the TE_{20} wave mode. Two antiphase coupling ports formed at prescribed distances from the center of the circular waveguide and along a diameter thereof which is perpendicular to the longitudinal axis of the rectangular waveguide transfer energy from the TE_{20} wave mode into a substantially pure TM_{11} mode in the circular guide when the proper electrical and magnetic field patterns are obtained at the ports by adjusting a movable plunger within the rectangular waveguide.

3,646,482

APERIODIC DISPERSIVE LOAD FOR HIGH-FREQUENCY, HIGH-POWER USE

Francois Ursenbach, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 12, 1970, Ser. No. 88,601
Claims priority, application France, Nov. 21, 1969, 6940100
Int. Cl. H01p *1/26*
U.S. Cl. 333—22 R **10 Claims**



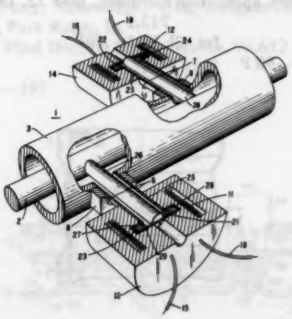
The load is formed as a plurality of terminal elements, one being the last and the others being complementary thereto; each one includes an external conductor and an internal conductor, the complementary terminal elements further including a peripheral conductor coaxially surrounding each complementary element and electrically connected to an adjacent peripheral conductor of an adjacent element, the open end of the external conductor of the first terminal element being interconnected with the adjacent end of the peripheral conductor of the next adjacent complementary element, the external conductors of two adjacent terminal elements being interconnected by a material transparent to the energy to be dissipated, or directly connected thereto; preferably, a resistive element may form the interconnection between an interior conductor and the closed end of an external conductor, and cooling means may be provided (such as by the formation of gaps and making the internal conductor hollow) to additionally dissipate a load.

3,646,483

MICROWAVE LOADED LINE FERRITE PHASE SHIFTER

John Ineson Smith, Morris Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 12, 1970, Ser. No. 45,694
Int. Cl. H01p *1/18*
U.S. Cl. 333—31 R **9 Claims**



An agile microwave phase shifter of the loaded line type using ferrite material as the active element. The active ferrite material is fabricated in the shape of an annulus and is disposed in a radial cavity which encircles and terminates a

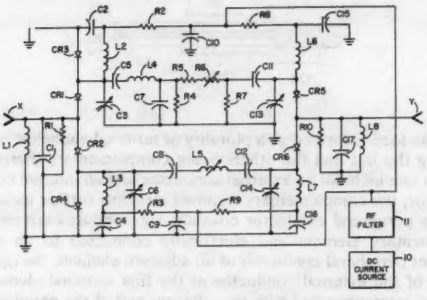
coaxial stub attached to a main coaxial transmission line. The ferrite annulus may be operated between states of magnetization that are either below or above the high-loss resonance region. To achieve low magnetization energy, short switching time, and low losses in signal power, the ferrite annulus is made very thin so that its internal magnetic field is substantially uniform and the total magnetomotive force required to produce a given field is small.

3,646,484

DIODE-SWITCHED RF ATTENUATOR

Donald E. Maxwell, Syracuse, and Roger W. Mazzochi, Solvay, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army

Filed July 8, 1970, Ser. No. 53,149
Int. Cl. H01p 1/22
U.S. Cl. 333—81 R **2 Claims**



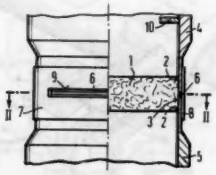
Bypass and attenuation paths are provided through respectively switched diodes. The diodes in the bypass path are turned on in response to direct current of one polarity, and off in response to the opposite polarity, and conversely for the diodes in the attenuate path. Filters are provided to exclude direct current from the bypass and attenuation paths, and to exclude RF from the source of direct current. Equalizers and compensators associated with each path allow phase-shift and attenuation to be accurately adjusted.

3,646,485

TRAVELING-WAVE TUBE WITH A VACUUMTIGHT CERAMIC WINDOW

Franz Gross; Paul Kahl, both of Munich, and Peter Mammach, Oberschleissheim, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 11, 1970, Ser. No. 45,510
Claims priority, application Germany, June 23, 1969, P 19 31 712.5
Int. Cl. H01p 1/08
U.S. Cl. 333—98 P **6 Claims**



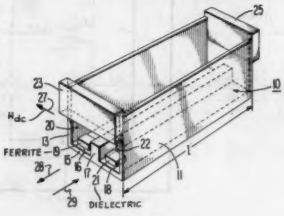
A traveling-wave tube is provided with a waveguide having a vacuumtight ceramic window therein disposed at the line of separation of a pair of separate portions of the waveguide. The ceramic window includes beveled edges which form solder limiting means along the inner surface of the waveguide during bonding of the window therein. A metal ring or band is tightly secured within a recess about the waveguide adjacent the ceramic window and includes at least one circumferentially disposed slot therein situated at the point of coupling of the tubular waveguide portions.

3,646,486

GYROMAGNETIC ISOLATOR WHEREIN EVEN MODE COMPONENTS ARE CONVERTED TO ODD MODE COMPONENTS BY BIASED FERRITE

Cheng Paul Wen, Trenton, N.J., assignor to RCA Corporation

Filed Oct. 28, 1970, Ser. No. 84,829
Int. Cl. H01p 1/32
U.S. Cl. 333—24.2 **11 Claims**



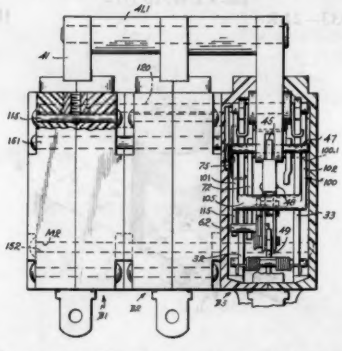
A symmetrical trough waveguide isolator for isolation of signals at discrete frequencies. The trough waveguide comprises two sidewalls spaced by a bottom wall and a shorter center wall or fin symmetrically disposed between the taller sidewalls and extending upward from the bottom wall. A slab of ferrite material biased by a DC magnetic field is located between one sidewall and the center fin and a matching slab of dielectric material is located between the center fin and the opposite sidewall. A conductive cover is placed at each end of the waveguide, the covers connecting the center fin to form a cavity only as to signals propagating in the odd mode. The even mode components of signals at frequencies to be isolated are converted to odd mode components by the biased ferrite.

3,646,487

MULTIPOLE CIRCUIT BREAKER

Lawrence W. Brackett, Sr., Georgetown, Mass., assignor to Wood Electric Corporation, Danvers, Mass.

Filed June 5, 1970, Ser. No. 43,737
Int. Cl. H01h 93/00
U.S. Cl. 335—8 **5 Claims**



In the embodiment described, three trip-free single-pole circuit breakers magnetically responsive to overload are joined side by side, adjacent sidewalls of the breaker casings

being provided with windows for swinging transfer rods. Each breaker has a toggle mechanism with a normally locked catch which on tripping of its armature opens the movable contact. The breakers have identical transfer trip cranks pivoted thereon, each trip crank having a contact bar, a trip leg and a trip transfer bar. The bars and the tube extend transversely of the swinging plane of the movable contact. The transfer trip cranks are connected by a transfer rod inserted in the transfer bars and passing to an adjacent breaker through the casing windows.

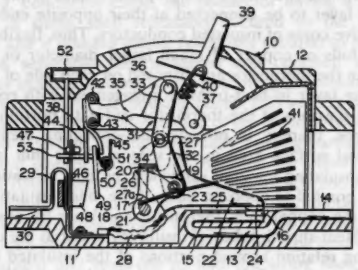
The contact arm of an overloaded breaker hits its contact bar, its connector bars swing about the crank pivots and the trip legs of the other cranks release the catches of the as yet closed breakers causing their toggles to collapse and their contacts to open.

3,646,488

ELECTRIC CIRCUIT BREAKER

Masachika Iida, and Yasutaka Imajyo, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 5, 1969, Ser. No. 874,244
Int. Cl. H01h *77/02*
U.S. Cl. 335—16 **1 Claim**



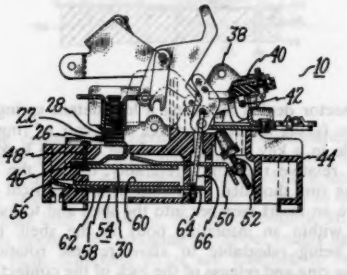
An electric circuit breaker has movable and stationary contacts which are operable automatically as well as manually. The movable contact is separated from the stationary contact by electromagnetic repulsion generated therebetween when there occurs a short circuit in the load circuit of the circuit breaker, causing the switching mechanism of the contacts positively to be collapsed independently of its automatic releasing device.

3,646,489

CIRCUIT BREAKER HAVING THERMAL AND MAGNETIC ACTUATION WITH IMPROVED MAGNETIC TRIP

Philip J. Hopkinson, Pittsfield, Mass., assignor to General Electric Company

Filed Sept. 23, 1970, Ser. No. 74,554
Int. Cl. H01h *75/12*
U.S. Cl. 335—35 **5 Claims**



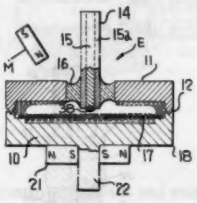
An electromagnetic circuit breaker having a bimetal operating member combined with a magnetic trip member. The bimetal member is provided with a steel assembly which acts as a trip extension member and also provides a low-reluctance flux path for the magnetic circuit. A magnetic armature of three layers of laminated steel is pivotally mounted below and parallel to the bimetal member and has a push rod which is connected to the latch plate to trigger the latch plate and open the circuit breaker contacts when sufficient short circuit current is present to attract the armature toward the bimetal.

3,646,490

MERCURY SWITCH

Sheldon S. Bitko, Cherry Hill, N.J., assignor to Fifth Dimension, Inc., Princeton, N.J.

Filed Aug. 24, 1970, Ser. No. 66,534
Int. Cl. H01h *1/08*
U.S. Cl. 335—58 **31 Claims**



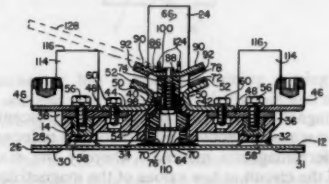
An attitude insensitive mercury relay included in a hermetically sealed nonmagnetic enclosure composed of a header and header cap, welded together in a high-pressure hydrogen atmosphere, including one or more stationary contacts extending insulatedly into the enclosure and a magnetic diaphragm as armature, in the form of a single planartight spiral having physically separated turns. In one form of the device, the interior of the enclosure and the diaphragm may be mercury wettable, excluding only an insulating feedthrough button for a stationary contact, and also excluding a portion of the face of the contact which is intended to sustain impact by the armature, the mercury wettable portion of that face being indented with respect to the impact area, and the quantity of mercury in the enclosure being sufficient, but only sufficient, to sustain a thin layer of mercury on the mercury wettable surfaces. In other forms the enclosure may be nonmetallic, e.g., ceramic, provided with mercury wettable screen surfaces.

3,646,491

MOVABLE CONTACT STRUCTURE FOR AN ELECTRIC SWITCH

Jordan F. Puetz, Milwaukee, Wis., assignor to Square D Comapny, Park Ridge, Ill.

Filed Dec. 18, 1970, Ser. No. 99,612
Int. Cl. H01h *1/50*
U.S. Cl. 335—197 **8 Claims**



A movable contact structure for a large size electric switch which is arranged so the contacts of the switch may be readily inspected. The contact structure includes a movable con-

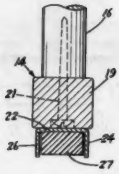
tact retainer that has apertured ears and the base of the switch which supports the stationary contacts includes support posts, which, when the switch is disassembled to inspect the contacts, are available to act as a fulcrum for the shank of a screwdriver when the tip of the screwdriver is inserted into the apertures. The screwdriver thus may be used as a tool to overcome the spring forces holding the movable contact retainer and thus facilitate the removal and replacement of the movable contacts from its position on the movable contact carrier.

3,646,492

MAGNETIC-PICKUP-DEVICE

Lillian D. Westermann, 255 East Second Street, Redwood Falls, Minn.

Filed July 16, 1970, Ser. No. 55,422
Int. Cl. H01f 7/20
U.S. Cl. 335—285 8 Claims



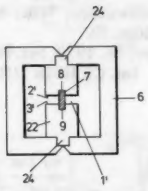
A hand-operated device for collecting and picking up metal objects, as pins, nails, clips or the like. The device has a crosshead secured to the lower end of an elongated handle. A U-shaped channel of magnetic material is secured to the bottom of the crosshead. A bar having magnetic properties is located within the channel establishing a flux force field in the channel operative to pick up and hold magnetic metal objects on the channel.

3,646,493

MAGNETIC CIRCUIT FOR AN INDUCTOR OR TRANSFORMER

Ernst Wiesner, Dornbirn, Austria, assignor to Walter Zumtobel, Dornbirn, Austria

Filed Dec. 18, 1970, Ser. No. 99,549
Claims priority, application Austria, Dec. 29, 1969, 12051
Int. Cl. H01f 27/24
U.S. Cl. 336—178 11 Claims



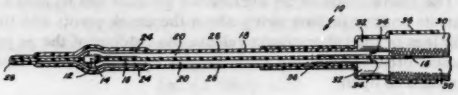
The magnetic circuit of a ballast for fluorescent lamps has an airgap whose effective width is locally reduced by an insert of ferromagnetic material, whereby the magnetization curve of the circuit at low values of the magnetizing force has two angularly offset, substantially rectilinear portions. The insert is readily manufactured to close tolerances and may facilitate assembly of the ballast and reduce hum as the ballast ages.

3,646,494

ELECTRIC MOTOR PROTECTOR SENSOR

Joseph W. Waseleski, Jr., Mansfield, Mass., and Ralph E. Charnley, Edmond, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 23, 1970, Ser. No. 5,428
Int. Cl. H01c 7/00
U.S. Cl. 338—25 6 Claims



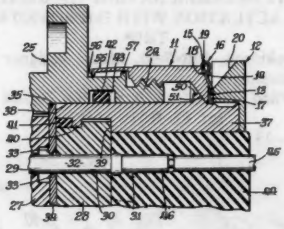
An electric motor protector sensor for use in pressurized atmospheres comprises a small thermistor of low-thermal inertia which is carried in an opening in a thin, inner layer of flexible, temperature-resistant, electrically insulating material to expose portions of the thermistor on opposite sides of the thin insulating layer. Ends of lead wires are connected to these exposed thermistor portions, the lead wires extending away from the thermistor along opposite sides of the thin insulating layer to be connected at their opposite ends to the conductive cores of insulated conductors. Thin, flexible, disc-shaped foils of copper of much larger diameter or surface area than the thermistor are disposed on each side of the thin insulating layer in heat-transfer engagement with respective exposed portions of the thermistor and with portions of the lead wires, thereby to provide heat-collecting members of substantial surface area in the sensor. Outer thin layers of similar insulating material sandwich the thin insulating layer and are bonded to opposite sides of the inner insulating layer around the copper foils, thermistor and leads for sealing the sensor. Heat-shrunk tubes of insulating material are disposed in sealing relation around portions of the insulated conductors and portions of the outer insulating layers of the sensor to complete sealing of the sensor.

3,646,495

CONNECTOR DEVICE HAVING DETENT LOCK

Richard R. Cowmeadow, Bramalea, Ontario, Canada, assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Jan. 19, 1970, Ser. No. 3,630
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 6 Claims



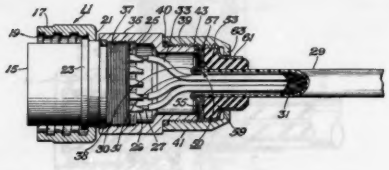
Connector device including a leaf detent spring disposed between facing annular surfaces of a pair of rings and engageable in a key slot in one of the rings to lock the rings against relative rotation. Preferably, one of the rings is a coupling ring threaded on a shell of an electrical connector to move an insert member into the shell and to lock contact means within an insulating body in the shell, the detent spring being releasable to allow reverse rotation of the coupling ring and release of the lock of the contact means, so that the contact means may be removed for servicing or replacement.

3,646,496

ELECTRICAL CABLE CONNECTOR AND GROUNDING MEANS

Robert A. Williams, Fort Worth, Tex., assignor to Williams Instrument, Inc., Fort Worth, Tex.

Filed July 30, 1969, Ser. No. 846,202
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 12 Claims



An electrical cable connector for attachment with a shielded, conductor cable, the connector having a coupling means, a sizing shell releasably secured to the coupling means, and a housing clamp releasably secured to the sizing shell. A separable ring is seated and confined against a shoulder inside the sizing shell by securing the housing clamp to the sizing shell, the housing clamp also serving to jam an expanded portion of the shielding of the cable between a split ring and a ferrule or ring, internally causing partial or 360° peripheral electrical continuity between the cable shielding and the sizing shell which, in turn, electrically and mechanically, peripherally connects to the external portion of the connector providing overall shielding to the connector contacts. Upon removal of the housing clamp, the split ring may be separated and removed so that the sizing shell may be moved rearwardly from the coupling means to expose the point of connection of the cable conductors to the electrical contact elements. Thus, both the grounding means and the electrical connection means of the connector are exposed for convenient inspection, repair or initial assembly.

3,646,497

SHOE WITH INTERCHANGEABLE HEELS

Bobby G. Gillikin, Beaufort, N.C., assignor to Martha Ann Willis, Harkers Island, N.C., a part interest

Filed Jan. 15, 1970, Ser. No. 3,029
Int. Cl. A43b 23/28
U.S. Cl. 36—58.5 4 Claims

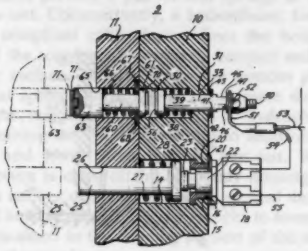
A shoe construction having angle irons mounted to the heel seat of the shoe for slidably mounting interchangeable low and high heels. An arch supporting plate is attached to the shoe shank for rendering vertical support to the shank when a high heel is utilized. An elastic band is attached to the upper opening for retaining the upper snugly against the wearer's foot. Stiffening strips are attached to oppositely disposed vertical arch portions of the shoe to prevent outward bulging of this shoe portion when the high heel is employed.

3,646,498

ELECTRICAL CIRCUIT CONTROL APPARATUS

Robert T. Reed, Moorestown, N.J., assignor to Walton Products Inc., Broomall, Pa.

Filed May 19, 1970, Ser. No. 38,775
Int. Cl. H01r 25/00
U.S. Cl. 339—48 6 Claims



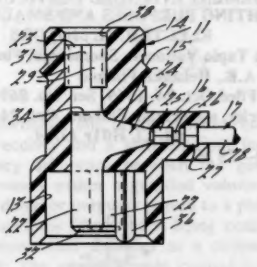
Electrical circuit control apparatus and more particularly a spring-loaded contact pin assembly is described for making and breaking electrical circuits, the structure being particularly suited for circuits of railroad cars which are coupled and uncoupled and which cannot have exposed electrically live contact pins.

3,646,499

MULTIPLE CONNECTOR

Don L. De Lano, Mount Clemens, and Francis C. Schmidt, Berkley, both of Mich., assignors to Microdot Inc.

Filed June 22, 1970, Ser. No. 48,020
Int. Cl. H01r 13/52
U.S. Cl. 339—60 M 9 Claims

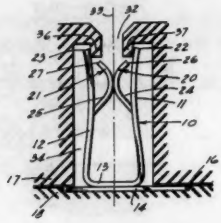


The connector has a body containing a plug receiving recess at one end with male terminals therein and a plug containing mating female terminals at the other end. The terminals are joined to conductors which extend laterally from the body. The connector is so constructed that the recessed end will receive the plug end of a second conductor or a plug which is similar to the connector but which has the recessed end omitted. The connector and plug provides flexibility in locating outlets at spaced points with the conductors connected in series.

3,646,500
ELECTRICAL CONNECTOR HAVING A CONTACT SPRING MOUNTED IN A HOUSING CAVITY

Hermann Wessely, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 25, 1969, Ser. No. 861,022
Claims priority, application Germany, Sept. 26, 1968, P 17 90 199.4
Int. Cl. H01r *13/62*
U.S. Cl. 339—65 4 Claims

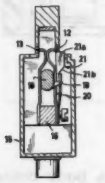


An electrical connector, of the type having a contact spring for unilaterally clamping a conductive contact member and being mounted within the cavity formed in a housing having a guide aperture intersecting the cavity and defining an insertion axis along which the contact member may be inserted for engagement with the contact spring, is characterized by the contact spring comprising an elastic contact portion normally biased toward the insertion axis for contacting an inserted conductor member with a predetermined unilateral contact force and a resilient portion attached to the contact portion and having a free end normally held in a deflected position by engagement with abutment means for outwardly biasing the contact to present an initial plugging force approaching zero and being deflectable to a position out of contact with the projection for presenting a sharply increasing plugging force and a gradually increasing contact force.

3,646,501
CONNECTING PLUG FOR A CURRENT SUPPLY RAIL ARRANGEMENT INTENDED PARTICULARLY FOR LIGHTING PURPOSES AND SMALL-SIZED ELECTRICAL MOTORS

Rainer Ilkka Tapio Valtonen, Suomenoja, Finland, assignor to Oy Nokia A.B., Helsinki, Finland

Filed Oct. 24, 1969, Ser. No. 869,267
Claims priority, application Finland, Oct. 24, 1968, 3026/68
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 M 4 Claims

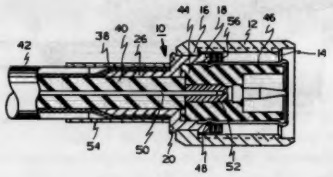


A connecting plug for a current supply rail, provided with contact fingers displaceable by means of manually turnable eccentrics from an inner inoperative position to an outer contact-making position. The plug is provided with locking means in engagement with the eccentrics for preventing turning of the eccentrics in an incorrect contact position of the plug in the current supply rail.

3,646,502
CONNECTOR ELEMENT AND METHOD FOR ELEMENT ASSEMBLY

Harold Gregory Hutter, Brookfield, and William Max Erich Zerlin, Newtown, both of Conn., assignors to The Bunker-Ramo Corporation, Oakbrook, Ill.

Filed Aug. 24, 1970, Ser. No. 66,351
Int. Cl. H01r *13/54, 17/04*
U.S. Cl. 339—89 C 4 Claims

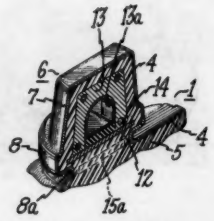


A body construction for a connector element which permits for easy captivation of a coupling ring on the connector body. The ring has a flange with a predetermined inner diameter while the body has an enlarged end section with a diameter larger than that of the flange inner diameter, at least one center section of diameter slightly less than the flange inner diameter, and an end section of reduced diameter. The center section includes a portion which is adapted to be bent up at an angle to the axis of the element when the flange of the coupling ring is over the center section to captivate the flange between the enlarged end section of the body and the bent-up portion of the body center section. Binding of the coupling ring as it is rotated may be eliminated by providing a slight undercut for the portion of the body section which is bent up.

3,646,503
HANDLING MEANS FOR A CABLE TERMINATION HOUSING HAVING STRESS ISOLATING MEANS BETWEEN THE HOUSING AND THE HANDLING MEANS

Henry N. Tachick, Pittsfield, Mass., assignor to General Electric Company

Filed Apr. 13, 1970, Ser. No. 27,613
Int. Cl. H01r *13/62*
U.S. Cl. 339—110 R 11 Claims



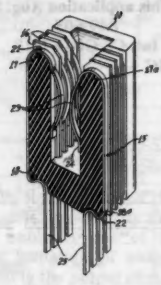
An electric cable termination housing is provided with an integral handling means mounted thereon in the form of a hook stick receiving handle that is mounted on one end of a resilient, flexible cylinder, which in turn is fastened to the termination housing. The resilient cylinder between the termination housing and the handling means serves to isolate from the housing stresses applied to the handle when a hook stick is used to manipulate the termination housing by applying force to the handle at a variety of different angles.

3,646,504

ELECTRICAL CONNECTOR

Edwin O. Classon, Wallingford, Conn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 17, 1969, Ser. No. 867,178
Int. Cl. H05r 1/07
U.S. Cl. 339—176 MP 6 Claims



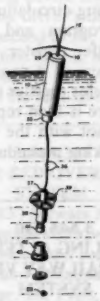
An electrical connector for printed circuit boards consisting of a series of contact members each having a curved contact section extending into the recess in an insulating block of generally cubical shape in which the printed circuit board is inserted and an external section provided with an integral terminal portion. The metallic contact member is in the form of an open loop and, being resilient, is mounted about the outer surface of the insulating block by spreading the ends of the loop to clear the locking protuberance formed on the bottom of said block. The curved contact section of the contact member forms a beam, the lower end of which is free to move as the beam is deformed by the insertion of the printed circuit board, and the pressure on the board contact or terminal decreases as the beam is deflected. As the circuit board is inserted into or withdrawn from the connector, the wiping action provides for good contact surfaces on the opposing contacts, and the withdrawal force required is greater than the force required to insert the circuit board in the connector.

3,646,505

AUTOMATICALLY DEPLOYABLE SONOBUOY

Woodrow P. Kirby, Hicksville, Ohio, assignor to The United States of America as represented by the Naval Air Systems Command

Filed Mar. 18, 1970, Ser. No. 20,689
Int. Cl. B63b 21/52
U.S. Cl. 340—2 6 Claims



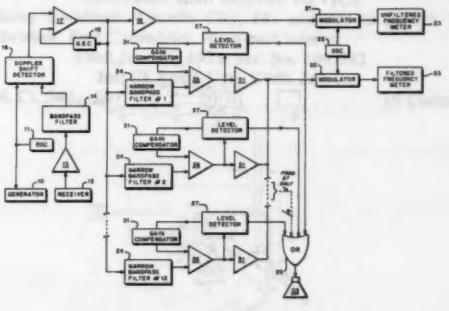
A sonobuoy arranged to be dropped into the sea from an aircraft and automatically deployed into an operational configuration. The prelaunch configuration is generally cylindrical for ejection from a conventional airborne launching tube. After ejection, a rotochute at the upper end of the sonobuoy automatically opens to stabilize and retard descent. Upon impact with the water, the impact pressure on a movable bottom plate at the lower end of the sonobuoy forces a release rod upward along the longitudinal axis to release the rotochute. When the rotochute is jettisoned, an antenna retainer is pulled free by a lanyard attached to the rotochute thus permitting antenna and ground plane elements to erect. When the bottom plate moves inwardly a split retaining ring holding the plate is released and subsequent reduction of the impact pressure, permits a pair of leaf springs to force the bottom plate out. Cocomittantly, a hydrophone, lower electronics and compliant cable deploy from the bottom. The upper end of the sonobuoy is positively buoyant and remains at the water surface. That is, when the bottom plate falls away, the leaf springs move out of coextensive slots at the bottom of the sonobuoy housing and a hydrophone cup thereby permitting the hydrophone cup to drop off and the hydrophone and lower electronics to pay out. When the lower electronics is clear of the sonobuoy housing, an umbrellalike sea anchor opens to introduce vertical damping. A sea-activated battery slidable from the upper to lower ends of the buoy is retained in the floating portion of the sonobuoy and provides electrical power.

3,646,506

SONIC DETECTION APPARATUS

Henry Suter, Hatboro, Pa., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 9, 1970, Ser. No. 31,042
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R 7 Claims



An improved swimmer and floater detector having a sonic generator and receiver and a shift detector indicating the doppler frequency difference between the generated and received sonic waves within a guarded volume of flowing water. The shift detector output is passed to a plurality of adjacent narrow bandpass filters, each being connected via a respective gain-controlled amplifier to a common multiple frequency meter. The amplifier gain control is nonproportional to the output amplitude and is operative in two modes to steadily increase or decrease the gain when the output is below or above threshold respectively.

3,646,507

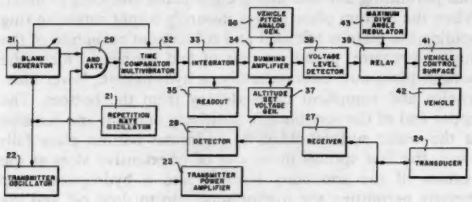
VEHICLE ALTITUDE CONTROL SYSTEM

James W. B. Foley, Lanesboro, Mass., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 5, 1966, Ser. No. 599,993
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R 9 Claims

An altitude control system for guiding a submarine vehicle in such manner as to search for and hunt along a reference

altitude above the sea floor having a sonar range signal generator, a vehicle pitch signal generator, an adjustable reference altitude voltage source, and a series-connected summing amplifier and direct current level detector coupled



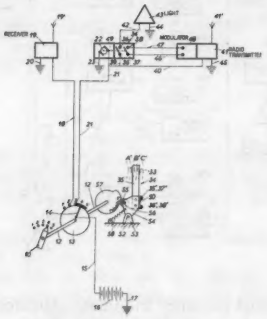
to the aforesaid range and pitch signal generators and said reference altitude voltage source for automatically regulating the control surfaces of said submarine vehicle in accordance with the algebraic sum of the output signals therefrom.

3,646,508

AUTOMATIC SIGNALING DEVICE FOR AUTOMOTIVE VEHICLES

Jacinto Rocha Da Silva, Quinta das Pousadas, Vagos, Portugal

Filed June 12, 1968, Ser. No. 736,508
Claims priority, application Portugal, June 3, 1968, 47 882
Int. Cl. G08g *1/00*
U.S. Cl. 340—33 **22 Claims**



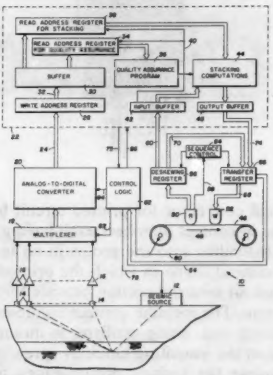
A system for receiving and transmitting signals, to be used with automotive vehicles. A receiver is provided for receiving radio signals transmitted through the atmosphere. Also a transmitter is provided for transmitting radio signals through the atmosphere from the vehicle. In addition, an illuminating device is provided for providing a visual signal. A selector switch is available to the operator of the vehicle for selecting either an operation wherein signals are received by the radio receiver or an operation wherein signals are transmitted from the illuminating device and the transmitter. When providing the visual signal and transmitting signals, a plurality of programs are provided according to which the illuminating structure and transmitting structure are operated in a predetermined sequence to provide intermittent signals at both of these structures. The selecting switch can be placed in a selected one of a number of positions selecting a given program when the illuminating structure and transmitter structure are used.

3,646,509

METHOD FOR FIELD STACKING SEISMIC DATA AND SYSTEM USING WRITE AFTER READ BULK DATA STORAGE

John M. Hughes; Stanley E. Lehnhardt, both of Dallas, and Byron C. Lochridge, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 694,530, Dec. 29, 1967, now abandoned. This application Aug. 8, 1969, Ser. No. 849,605
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 MC **5 Claims**



A seismic digital field stacking method and system in which the first seismic shot of a stack is initiated from a blast command recorded on a conventional magnetic tape which moves past a read head and then past a write head. The seismic response signal is detected and digitalized and temporarily delayed in the buffer of a digital computer for a predetermined number of words, and then recorded on the magnetic tape. After the entire seismic response from the first shot has been recorded on the magnetic tape beginning at a delayed point after the blast command, the tape is rewound. When the blast command again passes the read head, the second shot of the stack is initiated and the tape continues to run. The seismic response from the second shot is again digitalized and temporarily stored in the buffer of the digital computer while the computer performs conventional quality assurance calculations as the tape continues to run. When the first data word is read from the magnetic tape by the read head, it is stored in a transfer register while the computer performs the stacking circulations, taking into account the quality assurance program, and then updates the data word stored in the transfer register. Then as the next data word is read from the tape as it passes the read buffer, the updated word in the transfer register is rewritten on the magnetic tape. The procedure is then repeated to stack the new data from the second shot with the old data from the first shot, and the entire stacking procedure repeated for all successive shots in the stack.

3,646,510

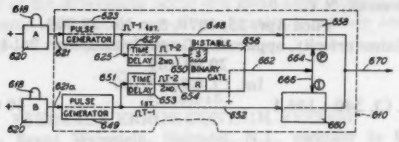
CIRCUIT FOR SIGNALING ALTERNATION ERROR IN DETECTORS FOR RAILWAY VEHICLE CONTROL SYSTEM

Donald J. Bailey, Palatine, Ill., assignor to Mangood Corporation, Grayslake, Ill.

Filed Feb. 27, 1970, Ser. No. 15,142
Int. Cl. G08g *1/015*
U.S. Cl. 340—23 **8 Claims**

In a railway vehicle control system having a pair of axle detectors spaced along the line of movement of a trail, a

distance less than the closest axle-to-axle spacing in standard railway vehicles, a detector-for-detector interrogation system which activates an error signal if either is repeated without alternation with the other. An error signal output circuit is



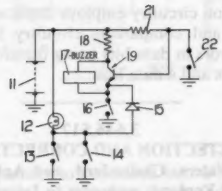
connected to receive signals through two control gates connected to input circuits activated by the two axle detectors. A control circuit unblocks one of the control gates in response to repeat actuation of either axle detector and places an error signal in the output circuit.

3,646,511

WARNING CIRCUITS FOR ROAD VEHICLES

William David Holt, Colne, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 29, 1970, Ser. No. 32,820
Claims priority, application Great Britain, June 9, 1969, 29,035/69
Int. Cl. B60q *5/00;* **G08b** *21/00*
U.S. Cl. 340—52 D **3 Claims**



In a warning circuit for a road vehicle for giving an indication to a driver if he attempts to leave the vehicle without removing the ignition key, one terminal of the vehicle battery is grounded and the other battery terminal is connected to ground through a warning device and a first grounded switch which is closed when the driver's door is opened. A second grounded switch is connected to the live battery terminal and is closed when the ignition key is in position, and means is provided for short circuiting the warning device when the first switch closes unless the second switch is still closed.

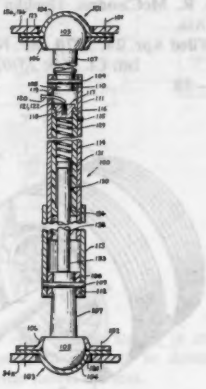
3,646,512

VEHICLE TRAILER BED OVERLOAD INDICATING SYSTEM

George J. Borgstede, 10537 Stewart Place, New Orleans, La.

Continuation-in-part of application Ser. No. 640,907, May 24, 1967, now abandoned , and a continuation-in-part of 689,157, Dec. 8, 1967, now abandoned , and a continuation-in-part of 722,276, Apr. 18, 1968, now abandoned. This application Sept. 1, 1970, Ser. No. 68,723
Int. Cl. G08b *21/00*
U.S. Cl. 340—52 R **10 Claims**

The invention comprises overload sensors comprised of intertelescoped contact carriers for installation between load-supporting areas, as truck beds and the vehicle axle means therebelow that support the leaf spring means which in turn yieldably support the load-supporting area or load bed. The



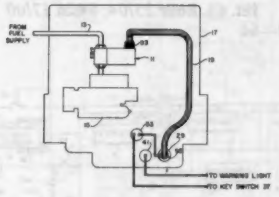
deposit of load on the load-supporting area compresses the leaf spring means and intertelescope the contact carriers to close circuit to sense or render indicia of overload.

3,646,513

VEHICLE INTERNAL-COMBUSTION ENGINE FUEL CONTROL AND SIGNAL DEVICE

Johnny Goodman, Granite City, Ill., assignor to Joseph J. Bristow, East Carondelet, Ill., a part interest

Filed Jan. 25, 1971, Ser. No. 109,392
Int. Cl. B60q *1/00;* **G08b** *21/00*
U.S. Cl. 340—53 **10 Claims**

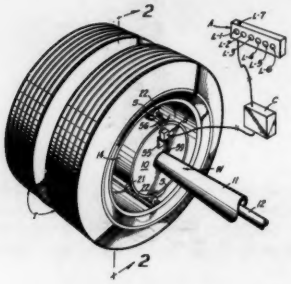


A control for preventing damage to an internal-combustion engine due to extended operation at excessive temperatures where the engine speed varies according to flow of fuel thereto. The control includes a fuel-limiting solenoid valve which controls the flow of fluid to the engine and which has a plunger movable from a first position permitting unobstructed fuel flow to a second position causing fuel flow reduction to a preset reduced amount causing engine speed reduction sufficient to reduce the operating temperature thereof, the valve having a winding which, when deenergized, permits movement of the plunger from the first position to the second position. Switch means is connected in a circuit with the winding for controlling the energization thereof and is responsive to the operating temperature of the engine. This switch means operates to cause deenergization of the winding when the engine operating temperature exceeds a preset level, thereby protectively reducing the engine speed to reduce its operating temperature.

3,646,514
VEHICLE LOW TIRE PRESSURE SIGNAL SYSTEM

Phillip G. Mitchell, 305 Highland Avenue, Opelika, Ala.; Fredrick S. Hagans, 8 South Church Street, Sylacauga, Ala.; James Noel Baker, 445 Opelika Road, Auburn, Ala., and Glenn R. McClendon, Opelika Highway, Drawer H, Lafayette, Ala.

Filed Apr. 24, 1970, Ser. No. 31,514
Int. Cl. 360c *23/02*
U.S. Cl. 340—58 4 Claims

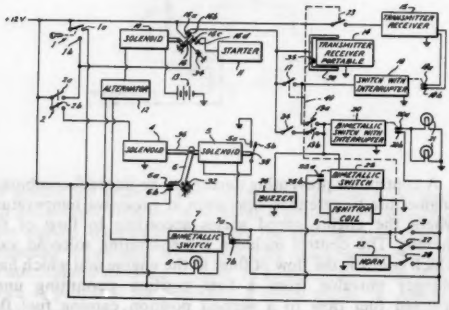


A low-pressure alarm system for pneumatic tires including a sensing unit operatively connected to each tire pressure, a detection unit carried by each stationary tire hub for detecting when the sensing unit is activated and a light panel connected to the detecting unit through a solid-state control circuit to indicate which tire assembly has a low pressure. The detection units are manually set to a detecting position and, once tripped by the associated sensing unit, remains tripped until manually reset.

3,646,515
VEHICULAR SAFETY AND REMOTE CONTROL SYSTEM

Frank Vodehnal, 1104 West Tri Oaks, Houston, Tex.

Filed Mar. 2, 1970, Ser. No. 15,513
Int. Cl. B60r *25/04*; F02n *17/00*
U.S. Cl. 340—64 18 Claims

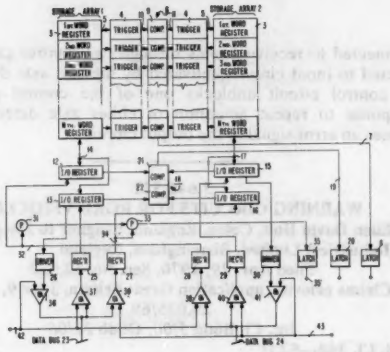


Vehicular safety and control system whereby the user upon leaving his vehicle unattended may prevent unauthorized use of his vehicle. Uses which the system makes available are: ceasing unauthorized operation of the engine, preventing unauthorized movement of the vehicle, and indicating whether the use is or is not authorized. The system can also be used to locate the car from among many in a large parking lot or for other location operations, and to start and stop the motor by remote control. This system also protects against engaging the starter of the vehicle once the motor is running.

3,646,516
ERROR-DETECTING CIRCUITRY

Michael Flinders, Chandler's Ford; Peter Lycett Gardner, Bishops Sutton; Michael Henry Hallett, Chandler's Ford; John W. Jones; John Francis Minshull, both of Winchester, and Keith Graham Taylor, Chandler's Ford, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1970, Ser. No. 28,900
Claims priority, application Great Britain, Apr. 24, 1969, 20,902/69
Int. Cl. G06f *11/00*
U.S. Cl. 340—146.1 10 Claims

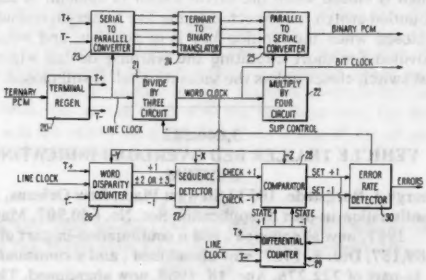


Error detection circuitry employs duplicate equal order binary registers and comparison circuitry for detecting and diagnosis of errors in data bits being transferred between the storage registers and a data bus.

3,646,517
ERROR DETECTION AND CORRECTION SYSTEM

Derek Brian Waters, Chelmsford, and Anthony Jessop, Enfield, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 15, 1970, Ser. No. 37,718
Claims priority, application Great Britain, June 25, 1969, 32,092/69
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1 10 Claims



This relates to an error detection and correction system for use in the receive terminal of a restricted disparity ternary code communication system. A word disparity counter and sequence detector detects sequences of consecutive ternary

code groups which should contain predetermined disparity characteristics. A differential counter computes the expected disparity characteristics of such sequences. The detected and expected disparity characteristics are compared and any differences therebetween adjusts the counter to compensate for the difference. An error rate detector also responds to the difference to provide an error signal when a predetermined number of the differences occur in a given time interval. The error signal indicates an out-of-synchronism condition and is employed to regain synchronism.

3,646,518

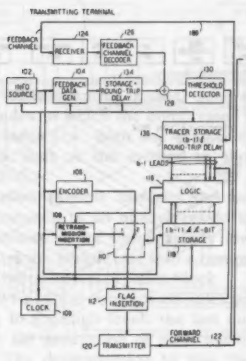
FEEDBACK ERROR CONTROL SYSTEM

Stephen Brant Weinstein, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 5, 1970, Ser. No. 34,770

Int. Cl. G08c *25/00*; G06f *11/00*

U.S. Cl. 340—146.1 **20 Claims**



Information sequences are encoded into a block code and both transmitted to a receiving terminal and stored at the transmitting terminal. The transmitted blocks are decoded at the receiving terminal and if uncorrectable errors are detected in a block, the receiving terminal transmits a feedback word to the transmitting terminal indicating that errors have been detected in the block in question. If uncorrectable errors have not occurred, the receiving terminal transmits to the transmitting terminal another feedback word which is a reduced version of the information portion of the block in question. Upon receipt of the feedback word, the transmitting terminal decides if a retransmission is required; if so, it substitutes, for the parity sections of subsequently transmitted blocks, that information sequence corresponding to the erroneous block.

3,646,519

METHOD AND APPARATUS FOR TESTING LOGIC FUNCTIONS IN A MULTILINE DATA COMMUNICATION SYSTEM

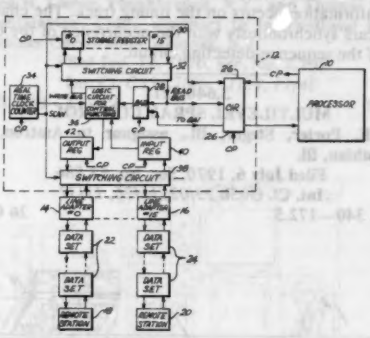
James E. Wollum, Glendora; Robert L. Rawlings, Diamond Bar, and James Clark Davidson, Glendora, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 2, 1970, Ser. No. 7,969

Int. Cl. G06f *11/02*; G05b *1/01*

U.S. Cl. 340—172.5 **3 Claims**

A data communication system in which a single control logic function is tested by writing a test control word for one communication line into a time-shared control circuit register from a processor. The control word together with a test line input word generated by the processor are coupled to the control logic for one clock period to perform one step of



the logic function, the result being stored in memory. The result is then interrogated in memory to determine if the result of the logic function meets the test.

3,646,520

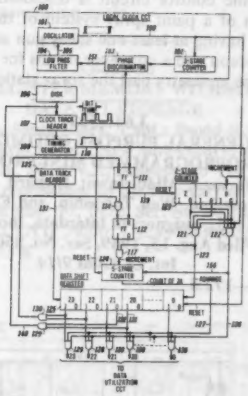
ADAPTIVE READING CIRCUIT FOR A DISK MEMORY

Robert Graham Spencer, North Aurora, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 25, 1970, Ser. No. 39,974

Int. Cl. G11b *5/02*, *31/00*

U.S. Cl. 340—172.5 **7 Claims**



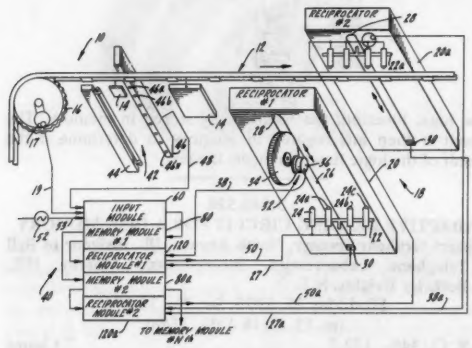
A circuit arrangement wherein a local oscillator is phase locked to information read from a timing track on a disk memory and serves to generate output pulses having a repetition rate several times higher than the repetition rate of the information on the timing track. For each data track of the memory there is provided a data-receiving circuit which comprises a shift register having its input connected to a data track reading circuit. Initially, data obtained from a corresponding data track is shifted through the shift register at a relatively high rate corresponding to the repetition rate of the local oscillator circuit. A sequence-detecting circuit is connected to a plurality of stages of the shift register for detecting the presence of a significant pattern of binary digits in the connected stages and for generating a discrete output signal upon the detection of this discrete pattern. Control circuitry which is responsive to the output signal of the sequence-detecting circuit serves to stop the advancing of data through

the shift register at the previously noted higher repetition rate and initiates the advancing of the data through the shift register at a lower rate which corresponds to the rate at which information occurs on the timing track. The change in rate occurs synchronously with the occurrence of the output signal of the sequence-detecting circuit.

3,646,521
MULTILEVEL SPRAY CONTROL

Virgle E. Porter, Steger, Ill., assignor to Amtron, Inc., Midlothian, Ill.

Filed July 6, 1970, Ser. No. 52,586
Int. Cl. G05b *23/02, 11/26, 11/32*
U.S. Cl. 340—172.5 **26 Claims**

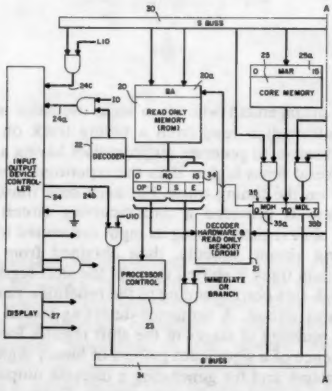


An electronic control circuit is disclosed for controlling the operation of a paint spray system of the type having a spray station having at least one spray gun assembly and one spray gun thereon and a conveyor means for transporting objects of diverse geometry past the spray station.

3,646,522
GENERAL PURPOSE OPTIMIZED MICROPROGRAMMED MINI-PROCESSOR

Arthur R. Furman, Middletown; Richard Jones, Holmdel; Charles Moreland, Wall Township, and Elliot Nestle, Neptune, all of N.J., assignors to Interdata, Incorporated

Filed Aug. 15, 1969, Ser. No. 850,519
Int. Cl. G06f *9/14*
U.S. Cl. 340—172.5 **2 Claims**

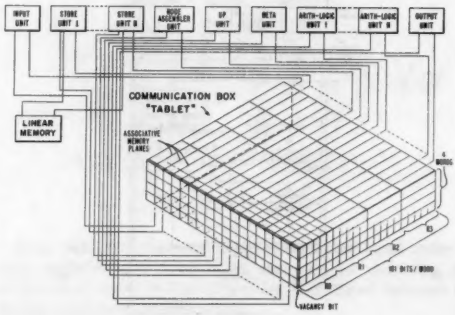


A processor system having a main memory to store user instructions and a read only memory which contains microroutines to emulate the user instructions. A user's instruction is fetched from the main memory and placed in an instruction register, a separate decode read only memory holds the individual starting address for the appropriate microroutine utilized in a current user instruction. The operation code of the user's instruction is applied from the instruction register to the decode read only memory for obtaining the starting address of a predetermined microroutine. Further, multiplication and division are performed according to a unique set of microroutines to significantly decrease processor operating time.

3,646,523
COMPUTER

Klaus Juergen Berkling, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,473
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 **14 Claims**

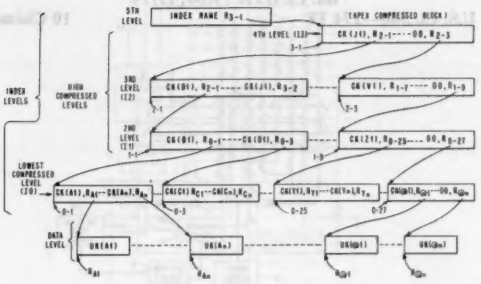


A computer is disclosed wherein the machine language thereof is a particular formal system, i.e., the "calculus of lambda conversion." Such machine language is the language of the "well-formed" formulas of the aforementioned lambda calculus whereby the theoretical properties of the lambda calculus are implemented in the computer. Consequently, the computer is capable of computing all computable functions with time and space being the only limitations. The nerve center of the system is termed a tablet which in one implementation may essentially consist of an array of high-speed registers, each one large enough to hold a primitive term together with its designator. The nodes of a tree given by some formula corresponds to rows in the tablet and the branches extending from the nodes correspond to columns in the tablet. In one embodiment, the tablet has three columns for the branches and can have a fourth column which holds the tree addresses of the nodes. Associative techniques permit access to a row upon a match with the contents of the data or designator fields of one or more columns. The basic unit of information consists of the contents of a complete row of the tablet, such unit being termed a "message." The tablet, functioning as a central communication device, communicates with functional units, memory units, and input-output units, the latter issuing and accepting messages, or merging them with existing ones when the units obtain access to the tablet. The invention contemplates either the accessing by the units of the whole tablet, one after another in a fixed sequence, or the accessing by each unit of only a subset of the tablet, all units simultaneously accessing discrete subsets respectively. In order to render all messages available to all units, all of the messages are circulated, i.e., shifted through the whole tablet.

3,646,524
HIGH-LEVEL INDEX-FACTORING SYSTEM

William A. Clark, IV; Charles T. Davies, Jr., both of Poughkeepsie, N.Y.; Kent A. Salmond, Los Gatos, Calif., and Thomas S. Stafford, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,462
Int. Cl. G05b 19/22; G06f 7/04; G06r 7/06
U.S. Cl. 340—172.5 52 Claims



High-level index-factoring system generates a multilevel compressed index in which the compressed key format in all levels of the index (i.e., high and low) are searchable by a single method, such as the method in allowed application Ser. No. 788,835.

The generation process includes the factoring of high-order bytes common to all uncompressed keys contributing to any compressed index block at any level; the factored high-order bytes are transferred into a compressed key in the next higher level compressed index block.

The high levels in the compressed index are built by selectively passing to the high levels the last uncompressed key (UK) used in the generation of each low-level compressed index block. The determination to pass the UK to a next higher level is made when the UK is the last UK used to generate the last-compressed key (CK) in the compressed index block at the current level. The propagation of a UK to successive high levels ends whenever the UK is used to generate a CK which does not complete a compressed index block. Thus the UK passing depends on the block completion function at successive levels.

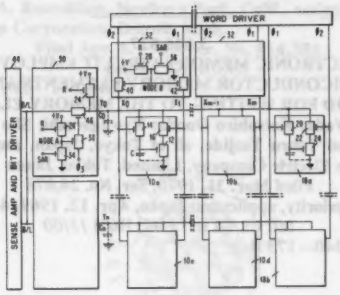
A different sequence of UK's is received by each high level. The CK's at any high level are generated from the sequence of UK's passed to that level; each high-level CK is generated from the current and prior UK's passed to the same level. Thus each UK passed to a high level is used to generate a current CK for that level, and then the UK is stored for that level so that it can later be used in the generation of the next CK for that level when a next UK is passed to it.

The key bytes in each high-level CK are taken from the UK currently passed to that level, beginning from a leftmost byte which is dependent on whether the currently passed UK is a right-shift type, a left-shift type, or no-shift type at the respective high level. The UK type at a high level is independent of its type at a lower level because the UK sequence is different. The rightmost key byte for the respective high level CK is determined by the low-level difference byte in the same UK determined by its use in generating a CK for the low-level index; this rightmost byte is independent of the UK type at the respective high level. If the passed UK is a left- or no-shift type at the respective high level, the key bytes for the high-level CK are taken from the high-level difference byte through the low-level difference byte. If it is a right-shift type of CK at the respective high level, the key bytes are taken from its position after the high-level difference byte in the prior UK for the same high level through its low-level difference byte.

3,646,525
DATA REGENERATION SCHEME WITHOUT USING MEMORY SENSE AMPLIFIERS

Richard H. Linton, Poughkeepsie, N.Y., and Thomas L. Palfi, Mountainview, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,292
Int. Cl. G11c 7/00, 11/24, 11/40
U.S. Cl. 340—173 CA 7 Claims

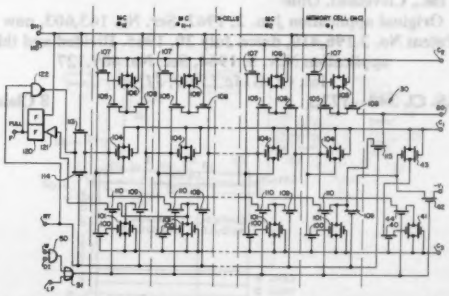


This specification discloses a scheme for regenerating the data in stored-charge storage cells of monolithic memories. The scheme involves the periodic reading out of the data in the stored-charge storage cells and temporarily storing the data in a regeneration cell. Thereafter the data is read out of the regeneration cell and back into the storage cell to complete the regeneration cycle.

3,646,526
FIFO SHIFT REGISTER MEMORY WITH MARKER AND DATA BIT STORAGE

Lloyd D. Fagan, Santa Clara, Calif.; David R. Hadden, Jr., Eatontown; David Haratz, New Shrewsbury, and Lorenz M. Sarlo, Matawan, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 17, 1970, Ser. No. 20,183
Int. Cl. G11c 19/00, 11/24; H03k 25/02
U.S. Cl. 340—173 R 7 Claims



A first-in, first-out (FIFO) memory having a plurality of memory cells, each for storing one data bit and one marker bit. The marker bit is provided for steering the data bits into successive memory cells when writing. Reading data is accomplished by shifting the data in succession out one end of the FIFO. Each memory cell consists only of MOS-transistors, which are connected so as to function as sample-

and-hold devices and clocked inverter devices. One sample-and-hold transistor and one inverter each connected to the same clock will store a bit, either data or marker. Sample-and-hold transistors and inverters are coupled between the bit storage sections of common and adjacent memory cells so as to provide the proper logic for steering the data bits for shifting to adjacent cells the data and marker bits.

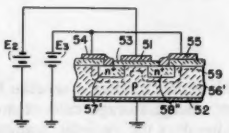
The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to us of any royalty thereon.

3,646,527

ELECTRONIC MEMORY CIRCUIT EMPLOYING SEMICONDUCTOR MEMORY ELEMENTS AND A METHOD FOR WRITING TO THE MEMORY ELEMENT

Toshio Wada; Katsuhiro Onoda; Ryo Igarashi; Sho Nakanuma, and Tohru Tsujide, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 31, 1970, Ser. No. 24,078
Claims priority, application Japan, Apr. 12, 1969, 44/28422
Int. Cl. G11c *11/40*; H01l *13/00*
U.S. Cl. 340—173 R **6 Claims**



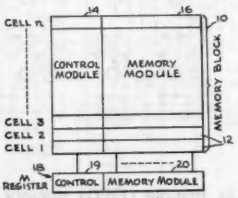
Data is written into a memory storage device by applying a negative voltage to the gate electrode of an MIS-type transistor, and a positive voltage to at least one of the drain and source of that transistor. The voltage difference between the gate and the source or drain exceeds a critical voltage so that electrons are injected and trapped in the gate film. Also disclosed is a memory matrix in which a plurality of MIS transistors are arranged in a matrix array and have their gate and source-drain electrodes connected to row-and-column drive lines.

3,646,528

SELF-SEARCHING MEMORY UTILIZING IMPROVED MEMORY ELEMENTS

Paul M. Davies, Manhattan Beach, Calif., assignor to TRW Inc., Cleveland, Ohio

Original application Jan. 2, 1962, Ser. No. 163,603, now Patent No. 3,196,410, dated July 20, 1965. Divided and this application Nov. 5, 1964, Ser. No. 409,127
Int. Cl. G11c *15/00, 11/44*
U.S. Cl. 340—173.1 **8 Claims**



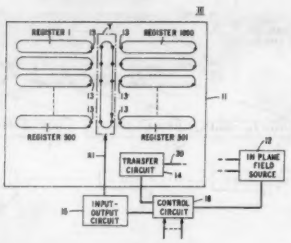
A superconductive associative memory system using the presence or absence of a persistent current to represent binary information. Readout is accomplished by association in comparators which may be selectively masked.

3,646,529

MAGNETIC DEVICES UTILIZING GARNET COMPOSITIONS

Andrew Henry Bobeck, Chatham; David Herbert Smith, Lebanon Township, Hunterdon County; Edward Guerrant Spencer, Murray Hill, and LeGrand Gerard Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 20, 1970, Ser. No. 30,071
Int. Cl. G11c *19/00, 11/14*
U.S. Cl. 340—174 TF **10 Claims**



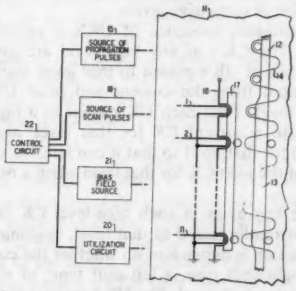
Magnetic crystalline materials of the garnet structure with suitable magnetic moments and with reduced temperature dependence of magnetic moment are advantageously incorporated in devices depending for their operation on "bubble" domains.

3,646,530

INPUT GATE ARRANGEMENT FOR DOMAIN WALL DEVICE

Woo Foung Chow, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 30, 1970, Ser. No. 76,882
Int. Cl. G11c *19/00, 11/14*
U.S. Cl. 340—174 TF **9 Claims**



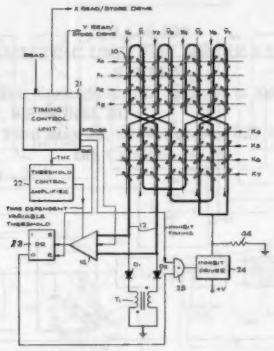
A first multistage domain shift register, of the type in which a domain is moved along a rail which defines the register, is employed in an input gate arrangement for an autonomous line scanner. Information in such a register is represented by a domain in one of two possible positions laterally displaced with respect to one another to a first and second side of the rail in each stage. A second rail parallels the first and is responsive to input (off-hook) signals to determine the lateral positions of domains there for interaction with and thus for determination of the lateral positions of domains in the first register.

3,646,531

MAGNETIC CORE SIGNAL DISCRIMINATION METHOD

Seishin Marahashi, San Jose, Calif., assignor to Core Memories, Inc., Mountain View, Calif.

Filed Oct. 10, 1969, Ser. No. 865,373
Int. Cl. G11c 7/02, 11/06, 5/02
U.S. Cl. 340—174 DC 1 Claim



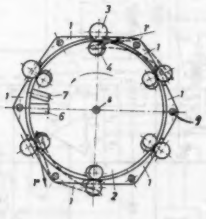
A ferrite core signal discriminating system is disclosed which uses a variable threshold for more accurate signal discrimination. A threshold control amplifier provides a time dependent threshold level to a discriminator with a high static level during initial read drive current periods and an exponentially decreasing level following the peak of noise and before peaks of ensuing core switching periods to improve discrimination of signal from noise.

3,646,532

DEVICE FOR THE PROCESSING OF ACCOUNT CARDS, MAGNETIC ACCOUNT CARDS OR THE LIKE IN AUTOMATIC ACCOUNTING MACHINES, ELECTRIC TYPEWRITERS AND SIMILAR APPARATUS

Udo Winter, Paderborn, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Apr. 24, 1970, Ser. No. 31,570
Claims priority, application Germany, Apr. 28, 1969, P 19 21 577.1
Int. Cl. B65h 5/06; G11b 5/00
U.S. Cl. 340—174.1 R 12 Claims



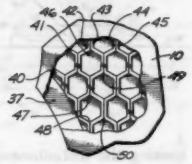
A device for the processing of account cards, magnetic account cards or the like in accounting machines, electric typewriters and similar apparatus comprises a gridlike drum for the admission and extraction of a card to and from a circular guide track and for guiding it therein. The guide track for the card is delimited internally by a number of spaced rigid guide rings mounted on a drum main shaft and externally by deflectors distributed over the periphery of the drum and pivoted one on either side of each guide ring to longitudinal bars so that always two neighboring deflectors are angularly displaced. The longitudinal bars are distributed over the periphery of the drum and one end face of the drum consists of a rigid plate, driving rollers and counterpressure rollers being provided in the vicinity of said rigid plate, in the zone of said guide track.

3,646,533

ROTARY DISK ASSEMBLY HAVING LOW-DENSITY CORE FOR INFORMATION STORAGE SYSTEM

Robert A. Rosenblum, Newbury Park, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 8, 1969, Ser. No. 814,384
Int. Cl. G11b 5/82
U.S. Cl. 340—174.1 R 15 Claims



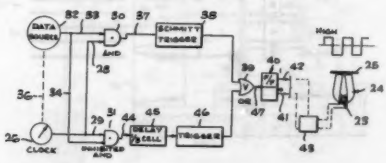
In a disk file information storage system, the rotary disk is constructed of a low-density core covered with a thin higher density outer skin. The core is preferably a honeycomb structure with cells whose axes are parallel to the axis of the disk. The skin is constructed of flat circular sheets of metal bonded to the ends of the core and an outer ring bonded to the sheets along the outside perimeter of the core. Assuming the core has a hole through its center, the skin includes an inner ring bonded to the sheets along the inside perimeter of the core. Thus, the core is sealed by the skin.

3,646,534

HIGH-DENSITY DATA PROCESSING

Wendell S. Miller, 1341 Comstock Street, Los Angeles, Calif.

Filed May 5, 1969, Ser. No. 821,627
Int. Cl. G11b 5/06
U.S. Cl. 340—174.1 G 31 Claims

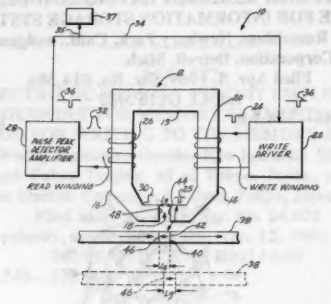


A high-density data processing system in which individual data bits are represented in coded form as changes in state of a predetermined data output unit, with two or more different types of bits being distinguished from one another by shifting the occurrence of a particular change of state to a slightly different time if it represents a bit of a first type than if it represents a bit of a second type. A decoding or playback device may then be designed to respond to the specified changes in state in a manner reading out the different types of bits in accordance with their relative timing.

3,646,535
METHOD AND APPARATUS FOR MEASURING TAPE SPEED

Michael I. Behr, South Pasadena, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 18, 1969, Ser. No. 877,698
Int. Cl. G11b 5/00
U.S. Cl. 340—174.1 B 20 Claims

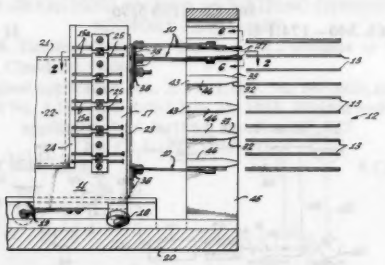


A monitor for sensing the instantaneous speed of a magnetic medium utilizing a single magnetic head having a first leg coupled to a signal generator and a second leg to a pulse peak detector for recording and detecting a timing signal as an incremental portion of the magnetic recording medium traverses the nonmagnetic gap defined by the head. The head is incorporated in a magnetic recording apparatus as a permanent part of the apparatus or in a portable probe. An output from the peak detector energizes the signal generator such that the frequency of the detected signals is a function of the instantaneous speed of the recording medium.

3,646,536
HEAD-POSITIONING APPARATUS

Lewis W. Bleiman, Northridge, Calif., assignor to SLI Industries, Van Nuys, Calif.

Filed Dec. 4, 1969, Ser. No. 882,234
Int. Cl. G11b 21/12, 5/54, 5/60
U.S. Cl. 340—174.1 C 14 Claims

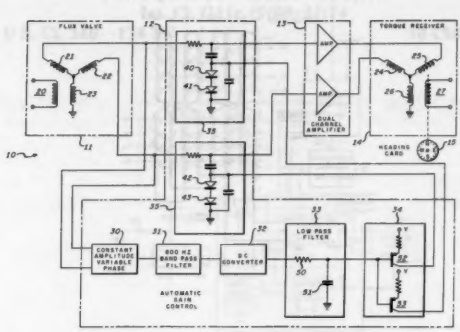


Apparatus for shifting a plurality of vertically spaced pairs of magnetic heads into a vertical stack of magnetic memory discs and pressing the heads of each pair in opposite directions against the discs above and below the heads, the heads being supported in side-by-side relation on resilient strips with an actuator between the strips for shifting the heads into engagement with the discs. The actuator comprises an elongated spring arm with two laterally projecting wings that are oppositely inclined from the horizontal when the spring is free, each wing having a follower on its tip engageable with a cam along the path of the tip to shift the wings away from the associated discs and stress the arms during retraction of the heads and to release the wings to the action of the springs during insertion.

3,646,537
AUTOMATIC GAIN CONTROL FOR AN ELECTROMECHANICAL TRANSDUCER

James R. Erspamer, and George W. Snyder, both of Phoenix, Ariz., assignors to Sperry Rand Corporation

Filed Mar. 13, 1970, Ser. No. 19,198
Int. Cl. G08c 19/00
U.S. Cl. 340—197 9 Claims

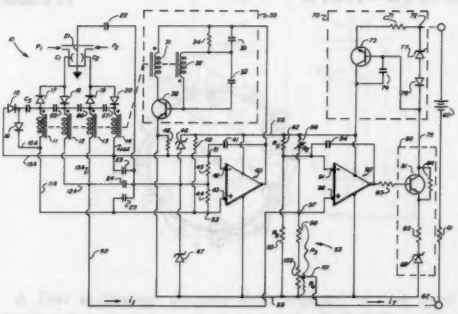


An automatic gain control for an electromechanical transducer apparatus for indicating direction which includes a transmitter, an amplifier and a receiver. The automatic gain control provides a constant output despite the presence of undesired variations in the strength of the horizontal component of the earth's magnetic field. The automatic gain control detects the amplitude of the undesired variations and controls the variable impedance that varies the gain of the amplifier in inverse proportion to the field strength thereby maintaining a constant output to the receiver.

3,646,538
TRANSDUCER CIRCUITRY FOR CONVERTING A CAPACITANCE SIGNAL TO A DC CURRENT SIGNAL

Roger L. Frick, Minneapolis, Minn., assignor to Rosemount Engineering Company, Eden Prairie, Minn.

Filed Oct. 27, 1969, Ser. No. 869,608
Int. Cl. G08c 19/10
U.S. Cl. 340—200 14 Claims



The circuitry including the variable capacitance sensor is excited by an external DC power source. A portion of the direct current power is converted to a high-frequency alternating current which is in circuit with the capacitance sensor and individual rectifying means for each of the capacitances. The rectified currents from the capacitances are compared to a reference current and the resulting signal together with a measure of all the other direct currents used by the circuit

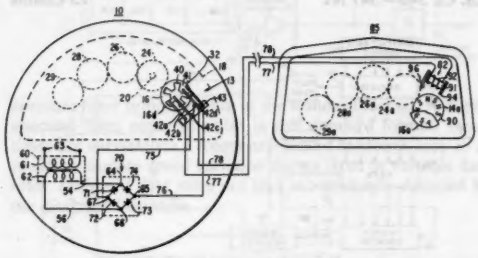
provide a signal to control the total current supplied to the circuitry. The total current then bears a prescribed and dependent relation to the capacitance of the sensor. The rectifying means form separate rectifying loops each of which is driven by an AC excitation winding. These rectifying loops are used in a special circuit configuration with a capacitance pressure sensor to provide a highly linear output signal as a function of differential pressure.

3,646,539

TRANSMITTING UNIT FOR METER EXTENSION SYSTEM

Dale F. Becker, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Filed May 26, 1969, Ser. No. 829,160
Int. Cl. G08c *19/16*
U.S. Cl. 340—203 **9 Claims**



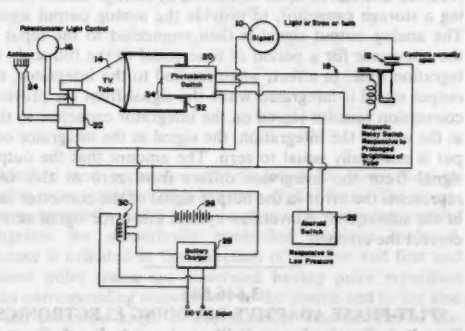
A transmitting unit connected to a remote receiver register for supplying direct current pulses to a stepping motor of the register, including a rectifier circuit for converting alternating current to full wave direct current pulses and a switch for producing pulses by reversing the polarity of the current pulses in response to measurement of commodity flow by the meter.

3,646,540

TORNADO ALARM

Roy L. Cooper, deceased, late of Waterman, Ill. (by Alberta M. Cooper, heir), assignor to Lynn F. Laseman, Waterman, Ill., a part interest

Filed Nov. 7, 1969, Ser. No. 874,872
Int. Cl. G08b *21/00*
U.S. Cl. 340—241 **3 Claims**



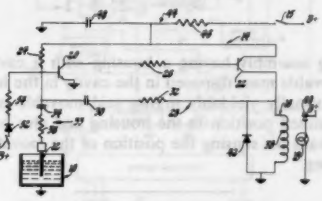
The tornado alarm consists of a simple TV-type tube circuit adapted to receive radio signals from an approaching tornado to light up the tube with a sustained brightness which is detected by an electric eye circuit to operate an alarm or warning signal of the approach of the tornado in time for taking all precautionary measures possible against loss of life or property damage. A barometric pressure switch is included in the alarm control circuit to make it operative only if the barometric pressure is substantially reduced, in order to prevent operation of the alarm should there be a local disturbance created accidentally to brighten the TV tube when there is no tornado in the vicinity.

3,646,541

FLUID LEVEL INDICATOR

Ward J. Rathbun, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of application Ser. No. 680,704, Nov. 6, 1967, now abandoned. This application June 4, 1970, Ser. No. 41,772
Int. Cl. G01f *23/24*; G08b *21/00*
U.S. Cl. 340—244 C **4 Claims**



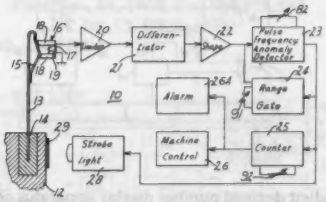
A fluid level indicator utilizing a transistorized relaxation oscillator, which is powered by a DC source, and a probe, which is positioned in a container so as to detect the absence of fluid at some critical level. The probe is either in circuit or out of circuit with the oscillator so that whether the probe is immersed in the fluid or out of the fluid determines the duration of the oscillator output pulses. If the probe is out of the fluid the duration of the output pulses increases enough to energize a relay. The energized relay causes a warning lamp to illuminate and provide a visual warning that the fluid is below the critical level.

3,646,542

MONITOR SYSTEMS

Myron L. Anthony, La Grange, Ill., assignor to Russell Mills, Inc.

Filed Feb. 25, 1970, Ser. No. 14,053
Int. Cl. G08b *21/00*
U.S. Cl. 340—259 **2 Claims**



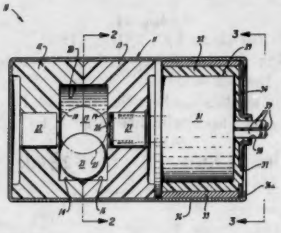
A monitor system for detecting bent, broken, missing or otherwise mutilated operating elements in a cyclically operable machine (e.g., the knitting needles in a rotary knitting machine) comprising a sensing device for sensing passage of individual operating elements, a detector for detecting mutilated elements from the output of the sensing device to develop an error signal, and a range gate for blanking the detector for most of a complete cycle or period after each error signal. A counter develops a control signal to shut down the machine on a given count of error signals occurring in consecutive cycles; a strobe light actuated by the error signals locates the mutilated operating elements.

3,646,543

SENSING ASSEMBLY

Harold D. Morris, Orinda, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Feb. 4, 1969, Ser. No. 796,378
Int. Cl. G08b 21/00
U.S. Cl. 340—262 15 Claims



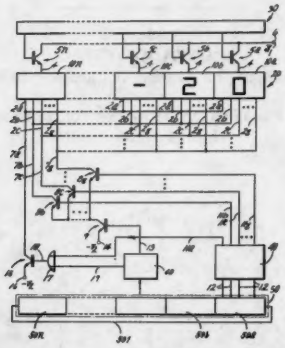
Sensing assembly having a housing with a cavity therein and a movable mass disposed in the cavity in the housing and means normally yieldably urging said movable mass into a predetermined position in the housing and also having electronic means for sensing the position of the movable mass in the housing.

3,646,544

APPARATUS FOR INDICATING NUMERICAL INFORMATION

Hiroshi Yamaguchi, Iwami-gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka-fu, Japan and Tottori Sanyo Electric Co., Ltd., Tottori-shi, Tottori-ken, Japan

Filed May 5, 1970, Ser. No. 34,788
Claims priority, application Japan, May 6, 1969, 44/730021
Int. Cl. G08b 5/22
U.S. Cl. 340—324 R 21 Claims



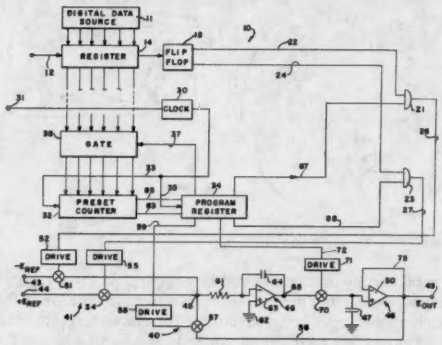
A multidigit decimal number display apparatus comprises a predetermined plurality of numeral display elements corresponding to a plurality of individual digit display positions each capable of selectively indicating a minus sign or any desired Arabic numeral. The apparatus displays the digits of the decimal number on a time-sharing basis in accordance with data identifying the digits of the decimal number and registered in a main circulation shift register. Means are provided for generating a logical state pattern signal identifying the stages of the main register containing data identifying the decimal number. Means responsive to the logical state pattern signal effects cancellation of zeros in all display positions exceeding the most significant digit of the decimal number. Further means responsive to the logical state pattern signal generates an enabling signal identifying the display position immediately preceding the display position for the most significant digit of the decimal number. The enabling signal is also responsive to the state of the decimal number as plus or minus to activate the immediately preceding display position to display a minus sign in accordance with that state. Each display element comprises a plurality of light-emitting segments having a minus-in-square configuration wherein the horizontal middle segment is activated to provide the minus sign indication.

3,646,545

LADDERLESS DIGITAL-TO-ANALOG CONVERTER

Bob N. Naydan, Wyckoff, and John D. Brinkman, Pine Brook, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 4, 1970, Ser. No. 43,489
Int. Cl. H03k 13/02
U.S. Cl. 340—347 NT 15 Claims



A charge-gated, ladderless, digital to analog (D to A) converter for converting a digital input signal into an analog output signal. The digital input signal is provided to an analog signal generating circuit, including a counter, which, upon command, generates an analog signal in the form of a pulse width which is a representation of the magnitude of the digital input signal and is a proportion of a predetermined maximum pulse width. The analog signal generating circuit includes means for applying a predetermined reference signal to the input of an integrating circuit for a period of time equal in duration to the pulse width representation of the digital input signal. The output from the integrator is received and stored upon command by storage means including a storage capacitor, to provide the analog output signal. The analog output signal is then connected to the input of the integrator for a period of time equal to the full scale integration time. In effect, when applied to the integrator, the output signal is integrated while the signal from the previous conversion remains stored on the integrator capacitor so that at the end of the integration, the signal at the integrator output is nominally equal to zero. The amount that the output signal from the integrator differs from zero at this time represents the error in the output signal of the converter and, in the subsequent conversion cycles, this error signal acts to correct the error.

3,646,546

SPLIT-PHASE ADAPTIVE DECODING ELECTRONICS

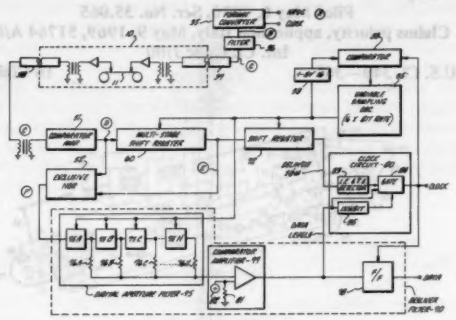
Kermit A. Norris, Azusa, Calif., assignor to Leach Corporation, North Coney, Calif.

Filed Oct. 10, 1968, Ser. No. 766,531
Int. Cl. H04l 15/00
U.S. Cl. 340—347 DD 32 Claims

A decoding system for decoding split-phase signals is disclosed. The system is operative for decoding signals which in-

clude extreme zero-crossing variations at either a fixed bit rate or variable bit rates.

A one-bit delay is employed for decoding the split-phase signals. A phase comparison circuit restores the split-phase signal (such as split-phase mark, S M) to standard digital format, (such as nonreturn-to-zero change, NR C). A digital



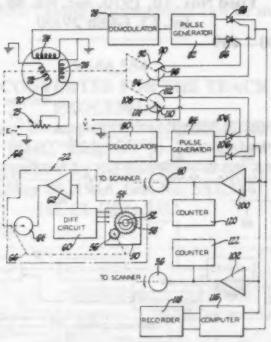
aperture filter removes noise in the standard format. A digital aperture filter removes noise in the standard format. Delay times are variable via a frequency-locked feedback loop so as to accommodate speed variation during fixed or variable data rates. Different data rates are also automatically decoded by the disclosed invention.

3,646,547

ANALOG-TO-DIGITAL CONVERTER FOR POSITIONAL COORDINATES

Norbert H. Hoffmann, Royal Oak, Mich., assignor to Albert J. Beni, Utica; Charles A. Bourdo and W. Keith Galbraith, Pontiac, Mich., part interest to each

Filed July 2, 1969, Ser. No. 838,421
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 SY **4 Claims**



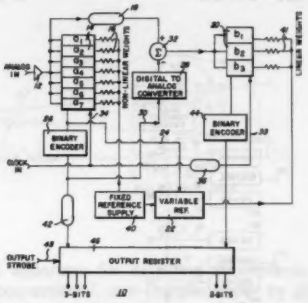
Method and apparatus are disclosed for converting an analog representation of a line into digital form. The invention is especially useful in connection with preparing control programs for numerically controlled machine tools. A scanner is oriented in the direction of the line and first and second pulse trains are generated having pulse repetition rates corresponding respectively to the cosine and to the sine of the direction angle of the scanner. The scanner is displaced with simultaneous components of stepwise motion along first and second axes in synchronism with the pulses corresponding respectively to the cosine and the sine of the direction angle and the scanner is continuously maintained in alignment with the direction of the line so that the system provides for self-checking of the accuracy of the digital data generated. The digital data is recorded on a suitable medium for subsequent playback to control a numerically controlled machine tool.

3,646,548

NONLINEAR ANALOG-TO-DIGITAL CONVERTER

Arnold H. Van Doren, Holliston, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of application Ser. No. 734,060, June 3, 1968, now abandoned. This application Jan. 15, 1971, Ser. No. 106,890
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **11 Claims**



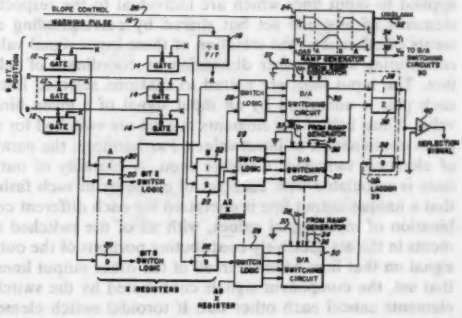
A high speed nonlinear analog-to-digital converter for producing a nonlinear or logarithmic transfer function which utilizes a parallel bank of nonlinear comparators and a parallel bank of linear comparators. The effective gain of the linear comparators is varied depending upon the portion of the logarithmic scale selected by the nonlinear comparators. This variation in gain is accomplished by changing the reference voltage of the linear comparators to coincide with the region of the input range in which the signal lies. The data flow through the converter is timed such that the nonlinear comparators are working on a second sample while the linear comparators are working on the first sample. All data from a complete sample arrives at the output terminals simultaneously.

3,646,549

GENERATOR WITH DIFFERENTIAL DIGITAL-TO-ANALOG CONVERTER

Joseph E. Bryden, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 25, 1968, Ser. No. 778,583
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 DA **7 Claims**



A vector generator employing a single differential digital-to-analog converter for changing from the analog of a first

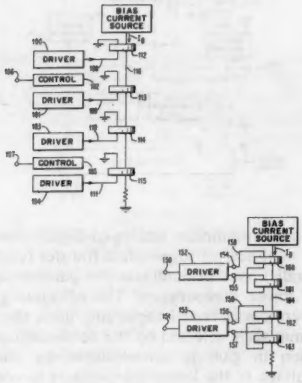
digital number to that of a second following any predetermined linear slope. The converter utilizes a single ladder network eliminating the differential errors which would be present in typical systems using two separate digital-to-analog ladder networks.

3,646,550

MAGNETIC DECODER NETWORK WITH MULTIDIMENSIONAL SELECTION CAPABILITY

Wilhelm Anacker, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1969, Ser. No. 887,870
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD **9 Claims**



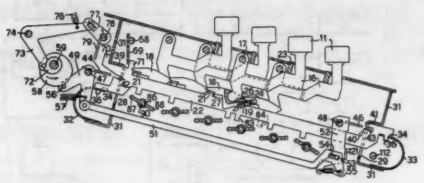
A decoding network with two- or three-dimensional selection capability is composed of magnetic switch elements such as toroidal cores, toroidal films or other films operated in the parallel-field switching mode. Each switch element has a response-excitation characteristic that enables the element to remain in a normal stable state unless it is subjected to an excitation in excess of a given threshold level, whereupon it switches to a different state, at least for the duration of the applied excitation. A coincidence of excitations applied in several selection coordinates may be required to condition an entire set or column of such elements for switching. The elements in each conditioned set or column are selectively switched in response to binary or other bivalued input signals applied to input lines which are individual to the respective elements of any one set but shared by corresponding elements of other sets, the selection of these input signal values constituting still another dimension or coordinate of selection. The input lines are paired so that one selected line of each pair is energized by an input signal of a given binary value. Thus, half of the elements in a set are switched for any given combination of input values. Furthermore, the number of elements switched is always even. A plurality of output lines is associated with each set of elements in such fashion that a unique output line is energized for each different combination of input signal values, with all of the switched elements in the set additively contributing portions of the output signal on that line; whereas in all of the other output lines of that set, the component signals contributed by the switched elements cancel each other out. If toroidal switch elements are used, they are arranged in relatively shiftable planes to facilitate threading the output lines through the switch elements in the desired individual wiring configurations.

3,646,551

KEYBOARD FOR CALCULATING MACHINES, ACCOUNTING MACHINES, TELEPRINTING MACHINES OR THE LIKE

Franco Bretti, and Emilio Gilardi, both of Caluso, Italy, assignors to Ing. C. Olivetti & Co., S.p.A., Ivrea (Turin), Italy

Filed May 6, 1970, Ser. No. 35,065
Claims priority, application Italy, May 9, 1969, 51764 A/69
Int. Cl. G08c *1/00*
U.S. Cl. 340—365 **10 Claims**



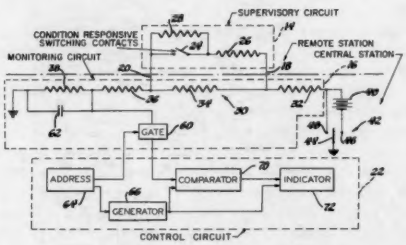
In a keyboard for calculating and like machines, upon the depression of each key, a corresponding elongated plate is shifted in a first direction substantially parallel to the long edge thereof to prearrange the selective setting of a series of code bars. The setter thus prearranged is thereafter shifted by motor in a second direction perpendicular to said long edge to set the code bars as to produce a corresponding binary code combination. Each plate is provided at the two ends with two U-shaped leaf springs engageable with two universal bars shifted simultaneously by the said motor so as to shift the prearranged plate through a pure translation.

3,646,552

TAMPERPROOF RESISTANCE-SENSING SUPERVISORY SYSTEM

David R. Fuhr, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1970, Ser. No. 88,458
Int. Cl. G08b *29/00*
U.S. Cl. 340—409 **2 Claims**



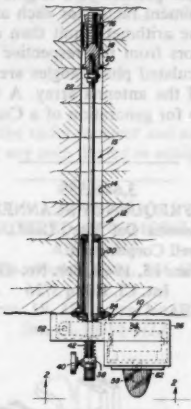
A supervisory system is provided for monitoring a plurality of remote stations from a central station. A supervisory circuit located at each of the remote stations is connected to a corresponding monitoring circuit located at the central station through a pair of conductors. The supervisory circuits each include a switching device operable between an opened position and a closed position. A control circuit located at the central station and connected to each of the monitoring circuits detects closed-switch, opened-switch, ground, short circuit and open circuit conditions existing in each of the supervisory circuits located at the remote stations. In addition, the control circuit detects the failure of any of the system components and the external application of an unauthorized voltage across any of the supervisory circuits.

3,646,553

ROOF MICROMETER AND WARNING INSTRUMENT

Ellsworth V. Conkle, P.O. Box 190, Paonia, Colo.

Filed Nov. 26, 1969, Ser. No. 880,184
Int. Cl. E21d *21/02*; G08b *21/00*
U.S. Cl. 340—421 7 Claims



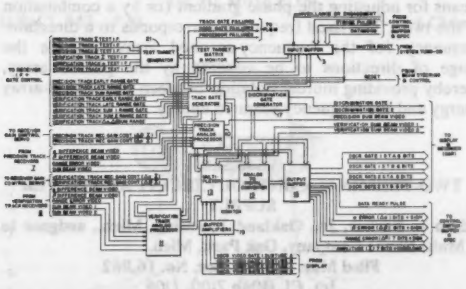
A bore is formed through the strata of a mine roof to allow deep insertion of an anchor therein. A support assembly passes through the bore and permits the mounting of a micrometer thereto. The lower end of the support assembly provides means for biasing a switch housing against the ceiling of the roof; As the housing moves downwardly in response to downward displacement of the roof ceiling, the micrometer actuates the switch and completes a warning circuit. Instead of the switch, a linear displacement transducer can be substituted so that as increased engagement between the micrometer and the transducer occurs, precise readings proportional to mine ceiling displacement can be made.

3,646,554

VIDEO PULSE CONVERTER FOR THE TRACK SIGNAL PROCESSOR

Stanley A. Fierston, Swampscott, and Bruce K. Nelson, Concord, both of Mass., assignors to The United States of America as represented by the Secretary of the Army

Filed May 19, 1966, Ser. No. 552,384
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 DP 6 Claims



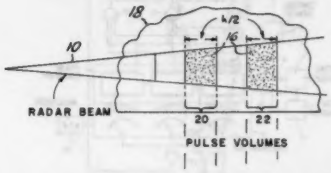
Precision and verification track processors receive radar information from receivers which may be fed by a test target generator. The analog outputs of the processors are simultaneously applied to a multiplexer. The analog output of the multiplexer is converted by an analog to digital converter whose output is fed through an output buffer to control switch buffer and to a computer. A track gate generator, a discrimination gate generator, and the test target generator are all controlled by the control switch buffer. The gate generators in turn control the operation of the processors, multiplexer, analog to digital converter, and output buffer.

3,646,555

METHOD AND APPARATUS FOR RADAR TURBULENCE DETECTION

David Atlas, 5522 South Harper, Chicago, Ill.

Filed May 2, 1969, Ser. No. 821,389
Int. Cl. G01s *9/02*; G01w *1/00*
U.S. Cl. 343—5 W 25 Claims



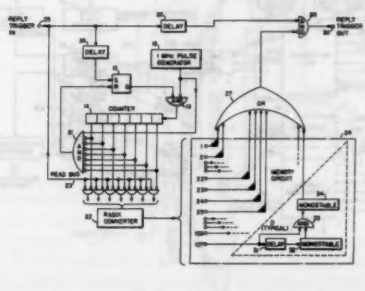
Method and apparatus for detecting atmospheric turbulence with a conventional, non-Doppler radar by detecting echo signals from two pulse volumes radially spaced apart along the radar beam. The measurement of the atmospheric turbulence is effected by measuring the average power of the echo signal from each of the two pulse volumes, by measuring the variance in the fluctuation spectra of these signals, and by measuring the variance of the signals representative of the predetection sum of the echo signals from both pulse volumes. The difference in the mean velocities of the scatterers in the pulse volumes, a measurement of the atmospheric turbulence, can be calculated since it is a function of the difference between the power-weighted variance of the fluctuation spectrum of the predetection sum of the echo signals from both pulse volumes and the sum of the power-weighted variances of the fluctuation spectra of the echo signals from each of the pulse volumes.

3,646,556

REFLECTED IFF INTERROGATION REJECTOR

Walton B. Bishop, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 25, 1970, Ser. No. 22,467
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 R 5 Claims



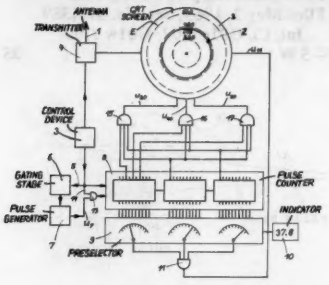
A technique of using the time between the direct path and the reflected path of an IFF interrogation to inhibit responses to succeeding reflected path interrogations.

3,646,557

APPARATUS FOR DISPLAYING DISTANCE REFERENCE MARKS ON A RADAR SCREEN

Kurt Scheer, Bremen, Germany, assignor to Fried. Krupp. Gesellschaft mit beschrankter Halftung, Essen, Germany

Filed July 10, 1969, Ser. No. 840,656
Claims priority, application Germany, July 23, 1968, P 17 73 894.2
Int. Cl. G01s 7/22
U.S. Cl. 343—13 R 8 Claims



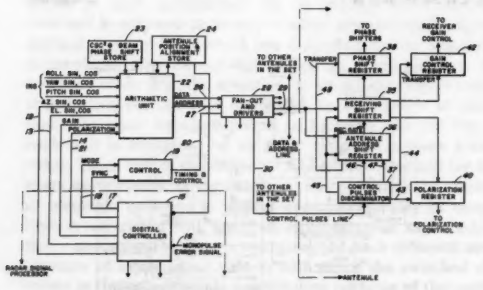
Apparatus for simultaneously producing an adjustable distance reference mark and fixed distance reference marks on the display device of a reflected-beam position-finding system. The apparatus includes a pulse generator for producing timing pulses, a pulse counter for counting the timing pulses and producing a digital output indicative of the count, a manually adjustable selector for producing a marking pulse each time the counter produces a digital output indicative of a particular preselected count and means for producing further marking pulses each time the counter produces a digital output indicative of a particular fixed count. The marking pulses produced are employed to cause the display device to display a mark indicative of a particular preselected distance and marks indicative of particular fixed distances.

3,646,558

PHASED ARRAY BEAM STEERING CONTROL WITH PHASE MISALIGNMENT CORRECTION

Matthew J. Campanella, Hammonton, N.J., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 20, 1970, Ser. No. 18,029
Int. Cl. H04b 7/08
U.S. Cl. 343—100 SA 7 Claims



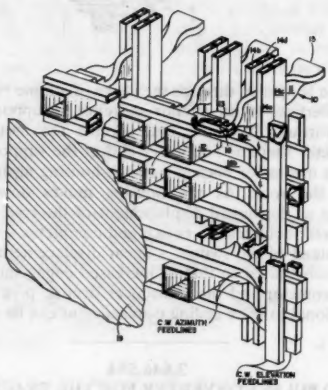
A system for remotely controlling the phase of active antenna elements in a phased array that has the capability of correcting the inherent phase misalignment of each individual antenna element within the array. Beam azimuth and elevation signals are fed into an appropriate arithmetic unit by a radar signal processor. Roll, yaw and pitch signals are fed into the same arithmetic unit by an inertial navigation system. The arithmetic unit, using the information from the inertial navigation system and the radar signal processor, computes the phase shift required for each individual antenna element in order to point the radar beam in the desired direction. To compensate for inherent phase alignment in the system, an antennule position and alignment store feeds a predetermined alignment factor for each antennule into the arithmetic unit. The arithmetic unit then adds or subtracts the alignment factors from the respective computed phase angles. All the calculated phase angles are then sent to the control circuitry of the antenna array. A Csc^2 beam phase shift store provides for generation of a Csc^2 beam at the array.

3,646,559

PHASE AND FREQUENCY SCANNED ANTENNA

Wiley, Carl A., Corona Del Mar, Calif., assignor to North American Rockwell Corporation

Filed Jan. 15, 1968, Ser. No. 699,756
Int. Cl. H01q 3/26
U.S. Cl. 343—100 SA 9 Claims



A multimode antenna for simultaneously providing at least one frequency-scanned mode and a phase-scanned mode. The isolated ports of the directionally coupled radiating apertures of a cross-fed frequency-scanned array, are adapted to be fed from a fixed frequency source by a phased array of voltage-controlled phase shifters or by mechanically scanned means for adjusting the phase gradient (or by a combination of the two). The fixed frequency corresponds to a direction-frequency (of the frequency-scanned array) outside the range of directions to be covered by the phased array, thereby providing mutual isolation between the phased-array energy and the frequency-scanned energy.

3,646,560

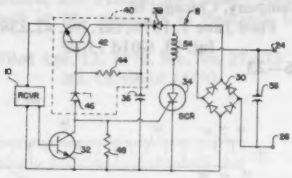
TWO-TERMINAL CONTROL CIRCUIT AND POWER SUPPLY

Edson L. Barlow, Jr., Oakland Township, Mich., assignor to Multi-Elmac Company, Oak Park, Mich.

Filed Mar. 5, 1970, Ser. No. 16,862
Int. Cl. H04b 7/00, 1/06
U.S. Cl. 343—228 3 Claims

Automatically operating electrical devices or equipment are operatively controlled by a radio control receiver circuit connected to an operating output circuit, provided with or without a manually operated switch, to actuate such devices

or equipment. Current furnished by a constant power supply is controlled by the receiver circuit to substantially continuously power both the radio receiver and an operating output relay for actuating any such device or equipment.

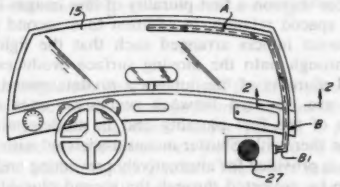


3,646,561

ADHESIVELY SECURED AUTOMOBILE WINDSHIELD ANTENNA

Edwin B. Clarke, Dorchester Apts., 266 W. Rittenhouse Sq., Philadelphia, Pa.

Filed Jan. 19, 1971, Ser. No. 107,683
Int. Cl. H01q 1/32
U.S. Cl. 343—711 **1 Claim**



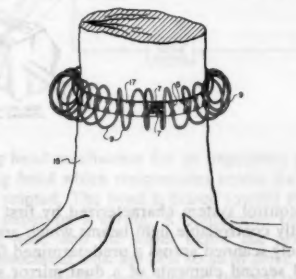
An automobile antenna which is adapted to be secured to be adhesively secured to the windshield in replacement of the fender aerial. The antenna is encapsulated within a pressure sensitive tape and permanently joined to the lead-in cable by a molded flexible coupling.

3,646,562

HELICAL COIL COUPLED TO A LIVE TREE TO PROVIDE A RADIATING ANTENNA

Morris Acker, Wanamassa; Kurt Ikrath, Elberon, and Wilhelm A. Schneider, Fair Haven, all of N.J., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 3, 1970, Ser. No. 43,153
Int. Cl. H01q 1/36
U.S. Cl. 343—720 **4 Claims**



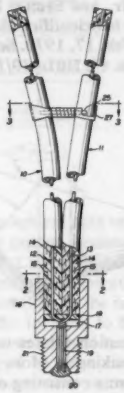
This device is an air-cored toroidal coil having dimensions much less than the wavelength of the applied frequency. It may be used as an omnidirectional antenna or as a coupler for converting a much larger object, such as a forest, into a giant antenna.

3,646,563

FREQUENCY-TUNABLE MULTIELEMENT ANTENNA STRUCTURE

Richard J. Francis, and Clara A. Francis, both of 11855 Broad St., Pataskala, Ohio

Filed July 22, 1970, Ser. No. 57,285
Int. Cl. H01q 1/40, 9/46, 21/00
U.S. Cl. 343—723 **11 Claims**



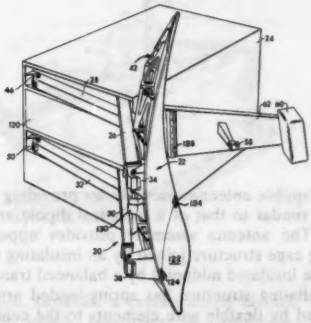
An antenna structure is provided having a plurality of elongated antenna units that are supported in mechanically coupled, longitudinally extending, side-by-side relationship but are relatively flexible to a spaced relationship for obtaining resonance at a predetermined frequency. Each antenna unit includes one or more electrically conductive elements with the elements of all units electrically interconnected at one end and structurally supported and protectively encased in a dielectric material comprising a fiber-glass-reinforced synthetic resin matrix.

3,646,564

ANTENNA SLEW SYSTEM

Cornelius J. Drislane, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1969, Ser. No. 803,626
Int. Cl. H01q 3/00
U.S. Cl. 343—766 **10 Claims**



An antenna azimuthal positioning mechanism formed from pairs of elongated antenna supporting struts pivotally

mounted on a fixed support structure and extending both outwardly and in crossed relationship therefrom to pivotally connect with an antenna whereby the antenna pivots with respect to the supporting struts as the supporting struts carry the antenna past an end of the fixed support structure to give a partial view to the rear of the support structure and thereby provide an azimuth sector scan subtending an arc which is greater than the pivoting arc of any one of the supporting struts. The supporting struts can be disconnected from the antenna to facilitate transfer of the antenna to a telescoping stowage support for antenna stowage.

3,646,565

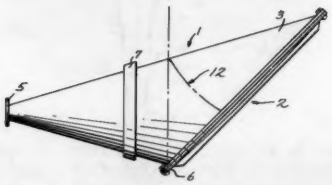
HORN-REFLECTOR ANTENNA

Glen P. Robinson, Jr., and Samuel F. Hutchins, both of Atlanta, Ga., assignors to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Feb. 17, 1970, Ser. No. 12,121

Int. Cl. H01q *19/14, 19/12*

U.S. Cl. 343—781 **5 Claims**



The present invention relates to a horn-reflector antenna and a method of making it. More particularly, it relates to a horn-reflector antenna consisting of a hollow cone composed of a microwave transparent material, lined in part with a microwave reflective material and a paraboloidal reflecting section which intersects with and is secured to the open end of the cone, the cone being unlined adjacent the paraboloidal reflecting section so that a portion of the cone functions as the radome.

3,646,566

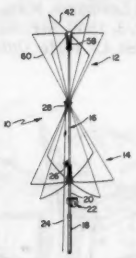
COLLAPSIBLE ANTENNA ASSEMBLY

George J. Neff, Jr., Erlanger, Ky., assignor to Avco Corporation, Cincinnati, Ohio

Filed Oct. 15, 1970, Ser. No. 81,026

Int. Cl. H01q *9/28*

U.S. Cl. 343—808 **8 Claims**



A collapsible antenna assembly for providing a broadband radiator similar to that of a biconical dipole antenna is disclosed. The antenna assembly provides upper and lower radiating cage structure joined by an insulating structure and fed at the insulated midpoint by a balanced transmission line. Each radiating structure has spring-loaded arms which are connected by flexible wire elements to the center or driving point of the assembly. Means are provided to permit the opening and closing of the radial arms when the antenna assembly is in the elevated position.

3,646,567

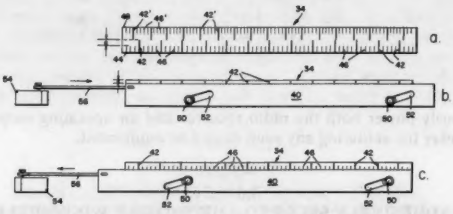
MULTIPLE GRID LINE APPARATUS FOR RECORDING OSCILLOGRAPHS

Rafn Stefansson, San Marino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 1, 1970, Ser. No. 42,236

Int. Cl. G01d *13/02*

U.S. Cl. 346—23 **9 Claims**



Apparatus for projecting one of at least two grid line patterns onto a moving oscillographic photosensitive record medium, without removing an included grid screen from the oscillograph. The opaque grid screen is characterized by a first plurality of transparent indicia arranged such that the light projected therethrough onto the moving surface produces thereon a first plurality of line images in predetermined spaced relation, in addition to a second plurality of transparent indicia arranged such that the light projected therethrough onto the moving surface produces thereon a second plurality of line images a predetermined number of which are disposed between successive ones of the line images of the first plurality and in predetermined spaced relation therewith. Shutter means associated with the opaque screen is provided for alternatively preventing and permitting light to be projected through the second plurality of indicia onto the moving surface, thereby permitting either the line images of both pluralities, or the line images of only the first plurality, to be recorded on the photosensitive surface.

3,646,568

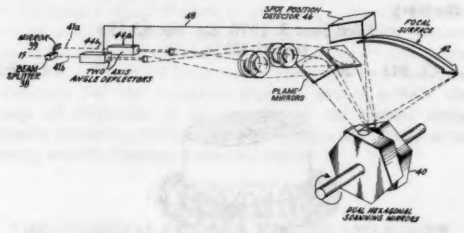
BEAM CONTROL SYSTEM

Dennis J. Woywood, Cherry Hill, N.J., assignor to RCA Corporation

Filed Apr. 3, 1969, Ser. No. 813,108

Int. Cl. G01d *15/14*

U.S. Cl. 346—108 **3 Claims**

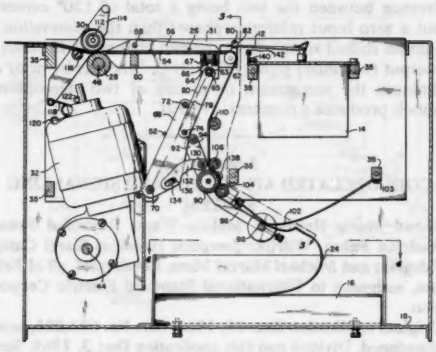


A beam control system characterized by first and second independently controllable light beams which are alternately and separately scanned across a predetermined focal surface by first and second elements of a dual mirror scanning assembly; the dual scanning feature permitting spot position corrections to be made to the nonscanning beam during the period that the remaining beam is in its scanning mode.

3,646,569
DRIVE ARRANGEMENT FOR VARIABLE WIDTH Z-FOLD CHART PAPER

Arthur R. Erbach, Des Plaines, and Albert Kupferschmidt, Chicago, both of Ill., assignors to Beckman Instruments, Inc.

Filed Apr. 13, 1970, Ser. No. 27,473
Int. Cl. G01d *15/30*
U.S. Cl. 346—136 9 Claims

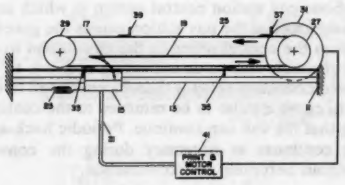


A drive arrangement for Z-fold chart paper is provided in which spaced apart guide means positioned between the back tensioning roller and the chart supply provide a positive lateral reference for the chart web just prior to its engagement with the back tensioning roller. The guide means may be conveniently changed in spacing to accommodate chart paper of different widths without requiring any readjustment of the drive rollers or the back tensioning roller.

3,646,570
PRINTING HEAD MECHANISM

Raoul E. Drapeau, Vienna, Va., assignor to Scope Incorporated, Reston, Va.

Filed Feb. 13, 1970, Ser. No. 11,077
Int. Cl. G01d *15/06*
U.S. Cl. 346—139 R 10 Claims

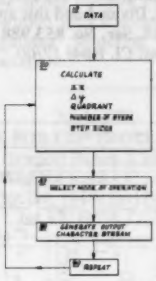


A printing head mechanism for an impactless printer having a printing head which reciprocates across the face of the paper to be printed. The head is biased toward the left-hand side of the paper by a spring. A continuous belt is driven between the head and the paper below the printing stylii. Means are associated with the belt so as to drive the head in a scan manner across the paper against the bias of the spring. At the conclusion of one line of printing, the head is released from the influence of the belt and returns to the left-hand side of the paper.

3,646,571
METHOD OF ENCODING GRAPHICAL DATA

George Y. Kurata, San Diego, Calif., assignor to Typagraph Corporation, San Diego, Calif.

Filed Mar. 18, 1970, Ser. No. 20,494
Int. Cl. G06f *3/14*
U.S. Cl. 444—1 34 Claims



A method of encoding graphical data to be displayed by an output terminal where the output terminal has plural modes of operation and procedures are undertaken to select, using past history and future anticipated operation, the fastest and most efficient mode of operation. In the faster modes, part of the information defining the location to be reached and the symbol to be displayed are stored and remembered. In these modes less information need be transmitted to the terminal to execute a move and successive moves are thereby executed faster. The optimum mode may be selected by examining previous location information to predict a possible mode change.

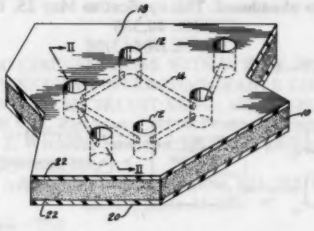
ERRATA

For Classes 174—68 thru 343—100 see:
Patent Nos. 3,646,572 thru 3,646,589

3,646,572
ELECTRIC WIRING ASSEMBLIES

Robert Page Burr, Huntington, N.Y., assignor to Photocircuits Corporation, Glen Cove, N.Y.

Continuation of application Ser. No. 704,383, Feb. 9, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 628,701, Apr. 5, 1967, now abandoned. This application Feb. 9, 1970, Ser. No. 10,039
Int. Cl. H05k *1/02*
U.S. Cl. 174—68.5 29 Claims



This invention provides a prefabricated electric wire assembly board which comprises an insulating base, a preformed, metal conductor bonded to the base, an aperture in the base intersecting the conductor such that at least one end of the conductor is exposed at the wall surrounding the

aperture, and a deposit of metal on the wall which contacts and forms an integral bond with the end of the conductor.

3,646,573

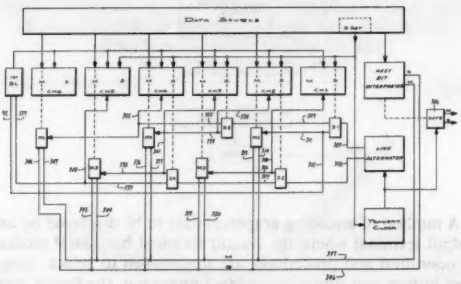
CIRCUITS FOR INTERCONVERTING GROUPS OF PARALLEL FORM AND SERIAL FORM SIGNAL BITS

Lawrence Holmes, Jr., 108 Jones Blvd., Las Vegas, Nev.

Original application July 29, 1965, Ser. No. 475,728, now Patent No. 3,453,379. Divided and this application Apr. 14, 1969, Ser. No. 853,988

Int. Cl. H04l *17/00*

U.S. Cl. 178—4.1 R **13 Claims**



A system for linking a first typewriter with a remote typewriter or other data processing device, whereby the first typewriter transmits groups of binary signal bits indicative of typewriter operations and may operate in response to received groups of signal bits, includes a converter circuit for translating groups of synchronous signal bits into corresponding serial form sequences of bits for transmission and also includes a converter circuit for translating received serial form bits into parallel form. In parallel to serial conversion the component bits of a group are sequentially transmitted out of each of a plurality of bit storage devices without being shifted through any of the storage devices other than the single one which stored each bit. In serial to parallel conversion each successive incoming bit is transmitted directly into an individual bit storage device without being shifted through any of the others. In part, this is made possible by bit storage devices which assume one state when storing a mark bit and an alternate state when storing a space bit and can also assume a third state to control a gate, when a bit has been transmitted into or out of the particular storage device.

3,646,574

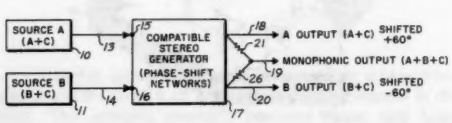
COMPATIBLE STEREO GENERATOR

Howard S. Holzer, 6530 Shoup Ave., Canoga Park, Calif.

Continuation of application Ser. No. 696,249, Jan. 8, 1968, now abandoned. This application May 25, 1970, Ser. No. 40,335

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 G **14 Claims**


SOURCE A (A+C)
SOURCE B (B+C)
COMPATIBLE STEREO GENERATOR (PHASE-SHIFT NETWORKS)
A OUTPUT (A+C) SHIFTED +60°
MONOPHONIC OUTPUT (A+B+C)
B OUTPUT (B+C) SHIFTED -60°

This invention relates to an instrument incorporating an otherwise independent pair of wide band unity gain amplifier chains of novel configuration providing in the several stages of each chain the capability of and means for shifting the phase of signals from stereophonic signal sources applied to each chain. The phase shift capability of one channel is over the range of zero phase shift related to the phase of the input signal through +90° and in the other channel over a range of from zero phase shift related to the phase of the input signal through −90°. The wide band phase shift networks are an element in the implementation of a means to apply the discovery disclosed in this invention that if the signal output of each respectively, of a pair of related stereophonic signal channels is applied to one, respectively, of said amplifier chains, one of the channels containing signals identified as *A+C*, and the other containing signals identified as *B+C* (the *C*-components of the signals being common to both channels) and the signal of the first channel shifted in phase +60° while that in the second channel is shifted in phase −60° (the difference between the two being a total of 120° centered about a zero input reference phase) then the summation of the phase shifted signals from the two channels will result in an output (summed) signal of *A+B+C*, whereas by prior art techniques the summation or mixing of two stereophonic channels produces a resultant *A+B+2C*.

3,646,575

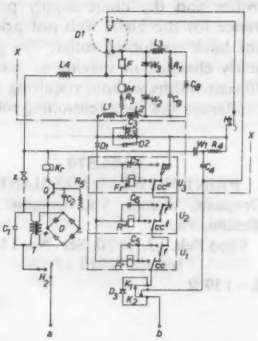
COIN-OPERATED APPARATUS AND SIGNALLING SYSTEM

Edmond Marie Heirbaut, Melsele-Waas; Raymond Francis Andrian Fabre, Wilrijk; Josephus Henricus Karel Camps, Edegem, and Michael Marcel Mees, Londerzeel, all of Belgium, assignors to International Standard Electric Corporation

Original application Dec. 15, 1966, Ser. No. 602,096, now abandoned. Divided and this application Dec. 3, 1969, Ser. No. 879,958

Int. Cl. H04m *17/00*

U.S. Cl. 179—6.3 R **3 Claims**



A telephone pay station central system in which answering of a call originated at the pay station causes the generation of a signal from the central office to the pay station to connect the coil collection and value-indicating network to the line loop. A coin collection relay is thereby energized to collect a coin and to cause a pulse to be returned to the central office indicating that the call can continue. Periodic back-and-forth signalling continues as necessary during the conversation period without disrupting the conversation.

3,646,576

SPEECH CONTROLLED PHONETIC TYPEWRITER

David Thurston Griggs a/k/a D. Thurston Griggs, 5128 Rolling Road, Baltimore, Md.

Filed Jan. 9, 1970, Ser. No. 1,739

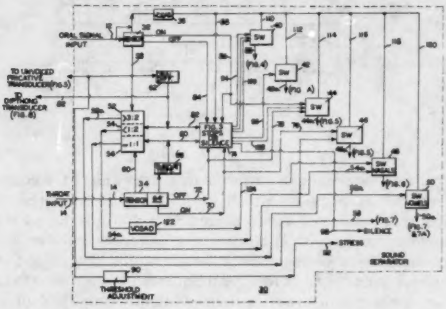
Int. Cl. G10l *1/16*

U.S. Cl. 179—1 SA **16 Claims**

To convert speech directly into print as it is being spoken, by machine, is a goal that has been thwarted by two critical wants: (1) a way to perform many complex selective operations with great speed, and (2) a way to close the gap between continuous speech as an unbroken sequence of

sounds on the one hand, and the distinctly separated words and spelling conventions of the printed language, on the other. Recently, taking advantage of the electronic computer's speed with multiplex programmed operations, acousticians have sought to achieve more accurate detection and separation of speech sounds. Such efforts have required programming and availability of extensive computer facilities to approach one step in the problem.

The approach described here, however, detects and analyzes speech sounds instantaneously without a computer,



converting the sounds by means of comparators, timers, filters, and switching circuits, into a real-time electrical phonemic analog of what is said; then it adds a special-purpose digital computer component to process and match syllabic sequences of sounds in the language. Thus, the computer element is smaller and is used not for phonetic detection but simply to give an output as close as possible to conventional printing as can be obtained by means of a prestored vocabulary of 12,000 words. The readout can be printed by a modern high-speed electric typewriter.

3,646,577

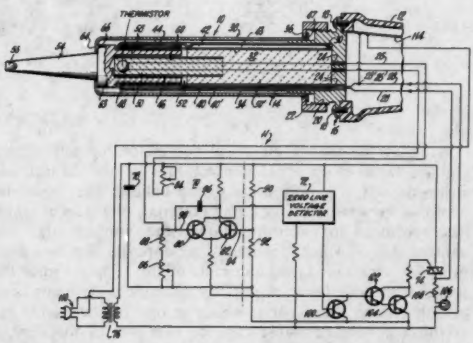
TEMPERATURE-CONTROLLED SOLDERING TOOL

Frank Ernst, Largo, Fla., assignor to National Cash Register Company, Dayton, Ohio

Continuation-in-part of application Ser. No. 797,044, Feb. 6, 1969, now abandoned. This application Mar. 30, 1970, Ser. No. 23,920

Int. Cl. H05b *1/02*; B23k *3/02*

U.S. Cl. 219—241 13 Claims



A temperature-controlled soldering iron with replaceable tip is described wherein a fast and accurate tip-temperature control is obtained both during no-load and load conditions. A temperature-sensing element is employed which is mounted to a heat-insulative handle and so placed relative to the tip and a heating element that the tip temperature is properly sensed, with rapid tracking fidelity; the rapid response is attributed to high-thermal resistance between the mounting of the temperature-sensing element and of the heating element, compared to low-thermal resistance (effectively thermal short circuit relation) in the path from the heating element to the sensing element via inserted part of the tip. A voltage source is used which exceeds the maximum voltage rating of the heater element by a preselected amount to obtain, in cooperation with a temperature-control circuit, a temperature-regulated soldering iron which quickly responds to load variations.

3,646,578

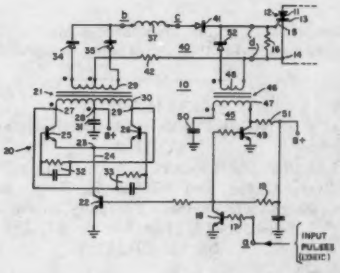
GATE DRIVE FOR CONTROLLED RECTIFIERS

Elmo M. Gregory, Newport Beach, Calif., assignor to Lear Jet Industries, Inc., Wichita, Kans.

Filed Oct. 21, 1969, Ser. No. 868,023

Int. Cl. H03k *17/30*

U.S. Cl. 307—252 J 8 Claims



An effective gate drive for silicon controlled rectifiers is provided by a relatively low-voltage, low-power electronic circuit, individual to each rectifier. The gate drive circuits hereof utilize a gated high-frequency oscillator, as a modified Royer type. Control logic ON pulses effect their oscillation, providing relatively narrow square wave pulses that are rectified to constitute the pedestal of each drive signal. A second portion of each gate drive signal is also initiated by the logic pulses, each with a rapid rise rate and of ample magnitude. The composite gate drive signal is transformer coupled to the associated SCR gate electrode, providing independence as to circuital grounding. Drive circuit is efficient and low in weight. Applicable in high-power-controlled rectifier systems.

3,646,579

LOGIC CIRCUIT PROBE WITH SCREW THREAD ADJUSTMENT AND INTERCHANGEABLE CIRCUITRY TO MATCH CIRCUIT BEING MONITORED

Philip S. Di Vita, Richboro; Earl N. Powers, Philadelphia, and Charles J. Werneth, Newtown, all of Pa., assignors to Data Display Systems, Inc.

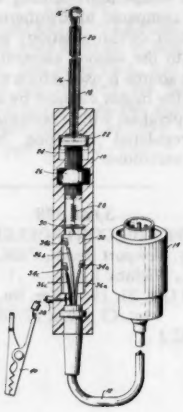
Filed May 2, 1969, Ser. No. 821,288

Int. Cl. G01r *31/02*

U.S. Cl. 324—72.5 8 Claims

A probe for use with microelectronic circuitry characterized by a screw-actuated clamping mechanism which affords the probe structure diminished portions while providing superior pin-coupling and locking ability. The probe is of general utility; however, it includes design features which specifically complement its use in association with digital circuitry. In this respect, a logic pack of the type used in the cir-

cuit to be monitored is positioned in the probe housing and electrically connected in the input thereof. The logic pack is



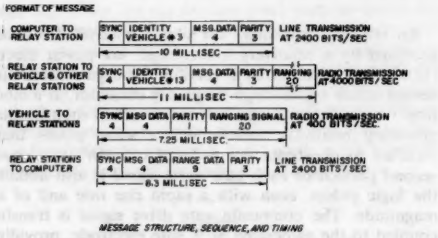
interchangeable to permit the characteristics of the probe to be directly matched to the circuit being monitored.

3,646,580

SURFACE VEHICLE FLEET COMMAND AND CONTROL SYSTEM

Roger L. Fuller, Stow; Robert K. Kaye, Framingham; Joseph J. Oliver, Allston, and William H. Rood, Acton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed July 18, 1969, Ser. No. 842,885
Int. Cl. G01s 9/56
U.S. Cl. 325—53 **7 Claims**


FORMAT OF MESSAGE
COMPUTER TO RELAY STATION
SYNC 4 | IDENTITY VEHICLE #3 | MSG. DATA 4 | PARITY 3
LINE TRANSMISSION AT 2400 BITS/SEC
10 MILLISEC
RELAY STATION TO VEHICLE & OTHER RELAY STATIONS
SYNC 4 | IDENTITY VEHICLE #13 | MSG. DATA 4 | PARITY 3 | RANGING 20
RADIO TRANSMISSION AT 4000 BITS/SEC
11 MILLISEC
VEHICLE TO RELAY STATIONS
SYNC 4 | MSG DATA 4 | PARITY 1 | RANGING SIGNAL 20
RADIO TRANSMISSION AT 400 BITS/SEC.
7.25 MILLISEC
RELAY STATIONS TO COMPUTER
SYNC 4 | MSG DATA 4 | RANGE DATA 9 | PARITY 3
LINE TRANSMISSION AT 2400 BITS/SEC
8.3 MILLISEC

MESSAGE STRUCTURE, SEQUENCE, AND TIMING

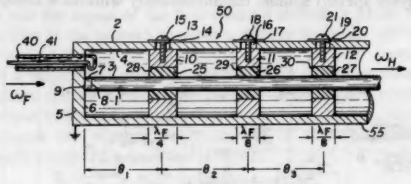
A system for communicating with and locating mobile surface vehicles in a high multipath signal clutter environment such as an urban center. This system seeks to take advantage of the scattering of the CW wave in urban areas for both communication and ranging where line of sight radiation techniques may not properly function. A plurality of remote relay stations are located at fixed points throughout the urban area. Each station receives and transmits wireless coded digital data and tone burst signals, the tone burst signals being used for phase ranging. Additionally, each of the surface vehicles is equipped with a transponder. The vehicle transponder is responsive only to a radio signal having a formatted message. This includes the vehicle identification code and a ranging tone suitably impressed thereon. The formatted signal is transmitted from one of the relay stations and picked up by a preselected number of other relay stations as well as the vehicle transponder. The transponder in turn generates a reply signal containing message data and a tone burst signal in phase with the original transmitted signal.

3,646,581

SEMICONDUCTOR DIODE HIGH-FREQUENCY SIGNAL GENERATOR

Martin I. Grace, Framingham, Mass., assignor to Sperry Rand Corporation

Filed Mar. 9, 1970, Ser. No. 17,673
Int. Cl. N03f 3/60
U.S. Cl. 330—56 **8 Claims**



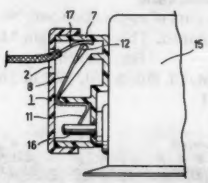
A microwave or high-frequency amplifier or frequency converter is disclosed which exploits avalanche phenomena in a semiconductor diode placed in a multiply tuned transmission line circuit. The novel configuration features means substantially avoiding loss of power within the circuit until high-frequency or microwave input energy is fed into the circuit, whereupon power is then efficiently amplified or converted within the circuit.

3,646,582

BALLAST

Gerard Herman Van Alphen; John Jongenelen, and Johannes Hendricus Franciscus Van Werd, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,297
Claims priority, application Netherlands, Oct. 25, 1968, 6815253
Int. Cl. H01r 9/12
U.S. Cl. 339—95 D **6 Claims**



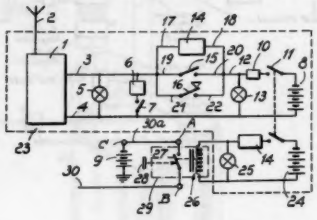
A ballast having an electrical connector for establishing contact between external contact lugs of the ballast and stripped ends of supply wires to the ballast. The connector comprises a socket of insulating material, one side of which has apertures for accommodating the contact lugs and another side of which, preferably the opposite side, has apertures for accommodating the ends of the supply wires. The socket is provided with a plurality of resilient elements comprising one or more parts, which at one of their ends can establish a nondetachable contact with one of the contact lugs and at their other end can establish contact with one or more ends of the supply wires. The resilient elements are preferably S-like resilient strips whose ends form an acute angle with an inserted lug, so that the resilient strips exert an axial force on an inserted lug, which prevents the lug from sliding out.

3,646,583

AUTOMATIC ACCIDENT SIGNALLING APPARATUS FOR MOTOR VEHICLES

Santi Scuderi, Fuchsweg 3, 3097 Liebfeld (Bern), Switzerland

Filed Aug. 18, 1969, Ser. No. 850,821
Claims priority, application Italy, Aug. 27, 1968, 39326 A/68
Int. Cl. B60q 9/00, 5/00, 1/00
U.S. Cl. 340—52 H 1 Claim



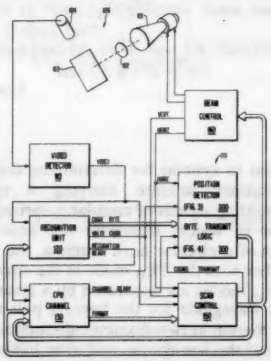
An automatic accident-signalling apparatus for motor vehicles, arranged inside the motor vehicle, comprising at least one device sensitive to collision and means-emitting signals controlled by said device sensitive to collision.

3,646,584

COORDINATE TRANSMISSION FOR CHARACTER RECOGNITION SYSTEMS

William W. Hardin, Stewartville, and Patrick J. Traglia, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,937
Int. Cl. G06k 9/04
U.S. Cl. 340—146.3AH 3 Claims



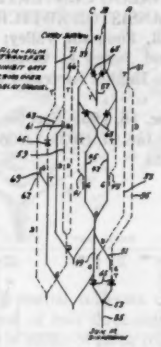
An optical character recognition system in which position data is detected by other than addressing a document field and is tagged on to a character identifying data byte. For documents in which the position of the character conveys information and for which the selected field to be scanned does not satisfactorily identify the character position, the scanning beam is tracked and converted into a position data byte when a character is detected. The position data byte is sent along with the character data byte to a utilization means.

3,646,585

MAGNETIC DOMAIN ADDER-SUBTRACTOR NETWORK

Harvey I. Jauvtis, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 31, 1969, Ser. No. 889,373
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 MC 4 Claims



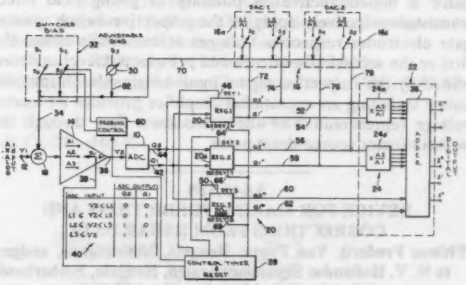
A combination adder and subtractor unit in two magnetic film layers in which magnetic domains representing binary bits are introduced and controlled through a series of magnetic domain diodes, fan-outs, and film-to-film transfers. Adjacent channels in different layers act as inhibit gates and in combination form exclusive OR gates.

3,646,586

ANALOGUE-TO-DIGITAL CONVERTER SYSTEM

Rainer Kurz, Oak Ridge, Tenn., assignor to Tennelec, Inc., Oak Ridge, Tenn.

Filed Apr. 28, 1969, Ser. No. 819,911
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 26 Claims



A serial-parallel analogue-to-digital converter system utilizes a conventional ADC having a relatively low number of channels together with at least one amplifier which may be set at different amplification factors, a conventional digital-to-analogue converter, and an arithmetic device that generates the digital output, to provide a fast conversion and an output having a substantially greater number of channels and a correspondingly high resolution. The conventional ADC is utilized several successive times at increasingly higher sensitivity through the use of the amplifier which may have its gain increased and its zero offset changed with each succeeding use of the ADC. Various means are described

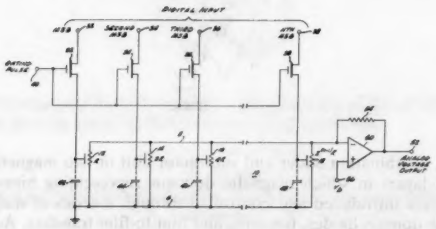
which may be employed for reducing or eliminating any errors which could be generated in the operation of this system. Additionally, particular circuit configurations are described which may be advantageously employed in the system for effecting the necessary gain changes with a minimum of error in result and a minimum of circuit complexity.

3,646,587

DIGITAL-TO-ANALOG CONVERTER USING FIELD EFFECT TRANSISTOR SWITCH RESISTORS

Everett L. Shaffstall, Fountain Valley; Carroll R. Perkins, Balboa Island, and James L. Gundersen, Carson, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 16, 1969, Ser. No. 885,518
Int. Cl. H03k *13/06*
U.S. Cl. 340—347 DA **4 Claims**



A plurality of field effect transistors having their source-drain paths connected in parallel are operated as switch resistors under the control of respective digital input bit signals. When biased to conduction with a gate voltage at a uniform first preselected level, each switch resistor provides in its source-drain path a resistance $R_n=2^{(n-1)}R$, where R is a predetermined resistance and n is a positive integer identifying the switch resistor in question. When biased with a gate voltage at a uniform second preselected level, each switch resistor is nonconductive. A plurality of gating field effect transistors selectively apply to the respective switch resistor gate electrodes respective voltages at essentially either the first or the second aforementioned preselected level as determined by the respective digital input bit signals. Output circuitry including an operational amplifier provides an analog voltage representative of the net current flow through the switch resistor source-drain paths.

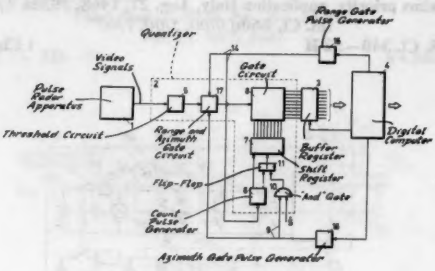
3,646,588

DEVICE FOR MAKING PREDICTIONS AND CORRECTIONS FROM RADAR DATA

Yftinus Frederik Van Popta, Hengelo, Netherlands, assignor to N. V. Hollandse Signaalapparaten, Hengelo, Netherlands

Filed Oct. 13, 1969, Ser. No. 865,583
Claims priority, application Netherlands, Oct. 18, 1968, 6814192
Int. Cl. G01s *9/14*
U.S. Cl. 343—7.3 **3 Claims**

A device for making predictions and corrections in azimuth and a given second coordinate (particularly the range) of a target to be tracked from video signals detected by a pulse radar apparatus. In such a device a varying number of bits is written in a buffer register for each detected video signal. The number of storage elements of that register correspond with the number of increments into which the measuring range is divided. These increments are shorter than the pulse duration. The contents of the register are placed in the store of a computer during each transmitter pulse interval. The real target position is obtained by selection of a group of bits from the total of bit positions as written in the store during consecutive transmitter pulse intervals and by logically processing said group of bits.

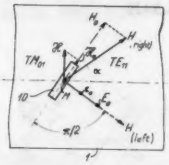


3,646,589

MULTIMODE TRACKING SYSTEM UTILIZING A CIRCULAR WAVEGUIDE HAVING SLOTS ANGULARLY ORIENTED WITH RESPECT TO THE WAVEGUIDE AXIS

Jean-Pierre R. Poitevin, 69, rue du Trosy, Clamart, France

Filed Dec. 15, 1969, Ser. No. 884,814
Claims priority, application France, Dec. 13, 1968, 178238
Int. Cl. H04b *7/00*
U.S. Cl. 343—100 PE **2 Claims**



Improvement to systems for determining the position of a telecommunications satellite carrying a radiofrequency beacon transmitting signals of circular polarization of a given direction and in which, whenever the beacon is off the boresight axis of a circular horn antenna, the TM_{01} mode is excited together with the TE_{11} mode in the circular horn. The TM_{01} and TE_{11} modes are separated by a system including a circular feed waveguide for the horn, a pair of rectangular slots formed therein at two diametrically opposite points in a cross section of the waveguide, said slots having their longer sides respectively perpendicular to the direction of the magnetic field at those points of the TE_{11} mode having said given direction of polarization, two rectangular section guides connected perpendicularly to the circular waveguide and having their long sides respectively parallel to the long sides of the slots so that the slots excite TE_{10} mode waves in the rectangular waveguide, a magic T having two input waveguides respectively connected to the two rectangular waveguides, an output guide relating to the antisymmetrical waves in the input guides, at whose output the signal relating to the TM_{01} mode is collected, and an output guide relating to the symmetrical waves in the input guides and comprising an absorber which absorbs the symmetrical waves.

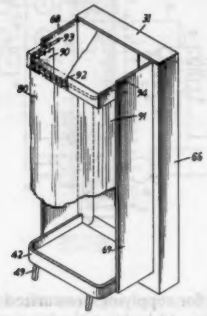
ERRATA

For Classes 4—146 thru 292—200 see:
Patent Nos. 3,646,590 thru 3,646,612

3,646,590
SHOWER CABINETS

Harry Collett Bolt, Woodbrook, Penn Road, Knotty Green, Beaconsfield, Buckinghamshire, England

Filed Apr. 13, 1970, Ser. No. 27,921
Int. Cl. A47k *3/23*
U.S. Cl. 4—146 14 Claims

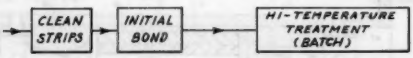


A shower cabinet which is collapsible so that when not in use it occupies small depth and comprises a back structure having a bottom tray, a roof, and two sidewalls, all pivoted to the back structure, means to effect a waterproof engagement between the sidewalls and the tray, and a front closure member.

3,646,591
METHOD FOR MAKING THERMOSTAT METAL

Seth R. Thomas, Middleboro, and John F. Clarke, North Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 18, 1968, Ser. No. 784,778
Int. Cl. B23k *31/02*
U.S. Cl. 29—487 10 Claims

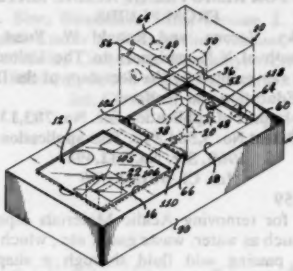


A process for making thermostat metals embodying a plurality of oxidizable metal layers such as layers of iron or iron alloy, is shown to comprise the steps of cleaning the surfaces of thin strips of such metals having relatively high and low coefficients of thermal expansion respectively, interfacially contacting the cleaned surfaces of the strips, squeezing the strips together with sufficient reduction of the strip materials to form incipient metallurgical bonds between the strips in the solid phase, and heating the resulting bonded composite material to a sufficiently high temperature for substantially completely dispersing oxides from the interfacially contacted surfaces of the strips into the strip material and for increasing the bonds between the strips by diffusion in the strip materials for substantially completely bonding the interfacially contacted surfaces of the strips together in the solid phase.

3,646,592
CUBE PATTERN GAME

Denis V. Bosley, Palos Verdes Peninsula, and Lucia C. Pearce, Altadena, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 23, 1969, Ser. No. 868,705
Int. Cl. G09b *7/00*
U.S. Cl. 35—9 D 8 Claims

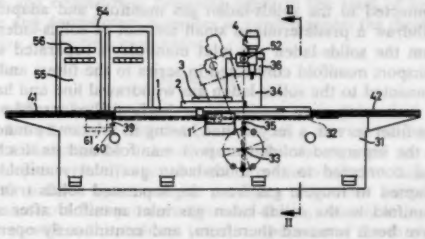


A game for testing spatial relations comprising a transparent cube composed of two three-sided members which can be fitted together in either of three rotational positions to form a cube. Each member has three-dimensional objects mounted on its inside so that different patterns are seen when the cube is viewed from each of its six different sides, there being a total of 18 different patterns formed for the three rotational positions of the members. A testing machine is provided which receives the cube, and any one of a plurality of cards, each card displaying one possible two-dimensional cube pattern which can be seen at one orientation of the cube on the machine. The cube has indicia along its edges and the cards have corresponding indicia, and the testing machine compares the indicia. The machine either turns on a light or sounds a buzzer, to indicate whether the arrangements seen on the cube and card match or do not match, respectively.

3,646,593
APPARATUS FOR THE AUTOMATIC SHARPENING OF BROACHING OR REAMING TOOLS

Ludwig Schubert, Solingen-Ohligs, Germany, assignor to Oswald Forst GmbH, Solingen, Germany

Filed July 7, 1969, Ser. No. 839,308
Claims priority, application Germany, July 5, 1968, P 17 52 718.3
Int. Cl. B24b *49/00*
U.S. Cl. 51—165 R 7 Claims



In an apparatus for automatically sharpening reaming or broaching tools, the spacing and pitch of the tool edges are mechanically scanned and a grinding disk is guided by electrical signals corresponding to the scanning values, a horizontal slide is provided for carrying the work blank, a vertical slide is movable about a horizontal axis, a grinding slide with

grinding spindles and grinding disks is mounted on the vertical slide for movement transversely of the horizontal slide with drive means for slide and spindle, the scanning means and grinding disk are provided at the grinding spindle and an electronic guiding means is provided for guiding the drive means.

3,646,594

PROCESS FOR REMOVAL OF ACIDIC MATERIALS FROM FLUIDS

Jack S. Lasky, Verona, and Ronald W. Fuest, Kinnelon Borough, both of N.J., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Continuation-in-part of application Ser. No. 783,137, Dec. 11, 1968, now Patent No. 3,564,818. This application June 11, 1969, Ser. No. 832,494

Int. Cl. B01d *53/00*

U.S. Cl. 55—59 **29 Claims**

A process for removing Acidic Materials especially SO_2 from a fluid such as water, waste gases, etc., which removal is achieved by passing said fluid through a shaped article formed from a polyolefin, a polyester or a nylon in admixture with a nitrogen-containing polymer.

3,646,595

SOLID-GAS SEPARATING MEANS

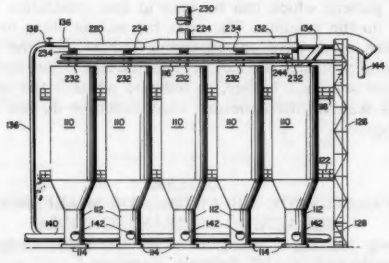
David C. Williams, Houston, Tex., assignor to Ashland Oil, Inc., Houston, Tex.

Division of Ser. No. 579,576, Sept. 15, 1966, Pat. No. 3,491,578.

Filed June 11, 1969, Ser. No. 832,382

Int. Cl. B01d *46/02*

U.S. Cl. 55—284 **4 Claims**



A solids transport system for a plurality of parallel-connected bag-type filters which includes a solids-laden gas inlet manifold connected in parallel to the tops of the filters, having a diminishing cross section from the first of the filters served to the last of the filters served and adapted to supply solids-laden gas to the filters, a clarified gas outlet connected to the top of the filters, a solids-laden gas withdrawal line connected to the solids-laden gas manifold and adapted to withdraw a predetermined small amount of solids-laden gas from the solids-laden gas inlet manifold, a separated solids transport manifold connected in series to the filters and also connected to the solids-laden gas withdrawal line and having an increasing cross section from the first filter served to the last filter served, a recycle line having its inlet end connected to the separated solids transport manifold and its discharge end connected to the solids-laden gas inlet manifold and adapted to recycle gas from the separated solids transport manifold to the solids-laden gas inlet manifold after solids have been removed therefrom, and continuously open orifices in the bottom outlets of the filters which are successively of decreasing diameter from the first to the last of the filters served by the separated solids transport manifold. A clarified gas repressure line can also be connected to the clarified gas manifold and to each of said filters through valves which permit a continuous flow of gas through the clarified gas outlet means.

3,646,596

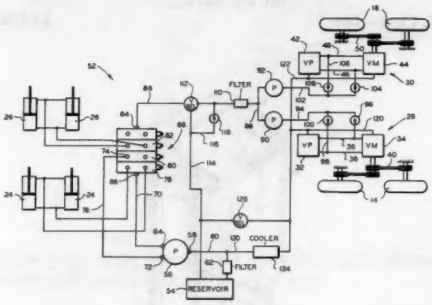
FLUID SYSTEM FOR A VEHICLE WITH FLUID DRIVE MEANS

James J. Bauer, Lisbon, N. Dak., assignor to Clark Equipment Company

Filed Jan. 26, 1970, Ser. No. 5,756

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 HE **11 Claims**



A fluid system for supplying pressurized fluid to the accessory motor means and hydrostatic drive means of a vehicle. The system includes first pump means and first valve means for controlling the supply of fluid from the first pump means to the accessory motor means. Also, second pump means is connected to the first valve means and hydrostatic drive means for supplying fluid to the hydrostatic drive means. Second valve means is connected to the first valve means, second pump means and a reservoir for bypassing fluid from the first valve means to the reservoir or drawing fluid from the reservoir to the second pump means.

3,646,597

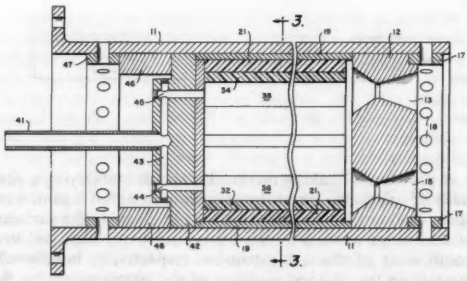
VARIABLE THRUST PROPULSION ENGINE

John R. Feemster, Saratoga, Calif., assignor to United Technology Center, Sunnyvale, Calif.

Filed Apr. 4, 1969, Ser. No. 814,893

Int. Cl. F02k *9/06*

U.S. Cl. 60—251 **2 Claims**



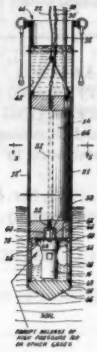
A variable thrust propulsion engine having a plurality of nozzles, a fuel section containing an outer core of a first solid propellant and an inner core of another solid propellant, said inner core of another solid propellant having a plurality of cavities therein, and means for supplying liquid oxidizer into said plurality of cavities.

3,646,598

PILE DRIVER SYSTEMS, APPARATUS AND METHOD FOR DRIVING A PILE

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed June 25, 1969, Ser. No. 836,309
Int. Cl. E02d 7/10
U.S. Cl. 61—53.5 **34 Claims**



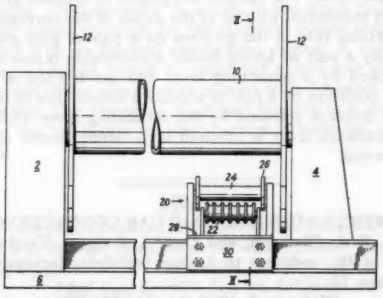
Pile driver systems and apparatus and method for driving a pile are described wherein a hollow pile is driven into the earth with the employment of a massive piston freely movable in the pile bore and normally resting on the pile. An air gun repeater is placed below the piston within the liquid containing pile bore to generate powerful thrusts upon its actuation. The thrust heaves the massive piston upwardly under guidance by the pile bore wall. When the piston again descends under guidance from the pile bore wall, it generates a momentum which is dissipated on the pile to drive the pile into the earth. In a preferred embodiment a double action pile driver is obtained by utilizing the thrust from the air gun repeater to produce an initial advance of the pile into the earth followed by a second advance when the massive piston dissipates its momentum on the pile.

3,646,599

APPARATUS FOR A METHOD OF FORMING COILED TUBE BANKS

Alexander Lightbody, 1 Weaver Lane, Kilbarchan, Renefrewshire, Scotland

Filed May 26, 1969, Ser. No. 827,625
Int. Cl. B21c 47/00; B21f 3/04
U.S. Cl. 72—147 **5 Claims**



A method of forming tube banks having means in the form of guide rollers for controlling the feed of the tubes to a rotating core for the effective production of an acceptable core of controlled dimension.

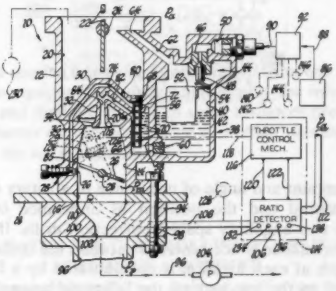
An apparatus for use in forming such tube bank adapted with guide rollers having braking means for use in controlling the speed at which a tube is fed to the rotating core.

3,646,600

METHOD AND APPARATUS FOR GAUGING FLUID FLOW

Kenneth C. Bier, Bloomfield Hills; Jerome J. Frankowski, Warren, and Gustav A. Schumacher, Almont, all of Mich., assignors to Holley Carburetor Company, Warren, Mich.

Filed July 9, 1969, Ser. No. 840,193
Int. Cl. G01m 15/00
U.S. Cl. 73—118 **14 Claims**



Method

In order to eliminate the effect of variations in barometric pressure, the throttle angle and volume rate of airflow through the induction passage of a second carburetor are matched to the throttle angle and volume rate of airflow through the induction passage of a first carburetor by creating a pressure downstream of the throttle valve of the second carburetor of a value which will produce a measured volume rate of airflow equal to the volume rate of airflow through the induction passage of the first carburetor and which will also, when compared to the then pressure upstream of the throttle valve of the first carburetor, result in a ratio of upstream and downstream pressures equal to the ratio of upstream and downstream pressures as existed across the throttle valve of the first carburetor.

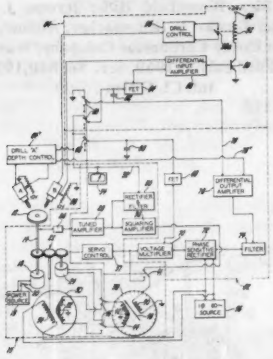
Apparatus

An orifice of predetermined flow capacity is situated at a point downstream of the throttle valve of a test carburetor and the downstream side of the orifice is exposed to a reduced pressure sufficient to cause a predetermined volume rate of airflow therethrough; pressure responsive means responsive to a first pressure between the throttle valve and orifice as well as the ambient pressure upstream of the throttle valve is effective for computing the ratio of said first pressure and said upstream pressure; if the said ratio does not equal a predetermined value the pressure responsive means creates an error signal to an associated control mechanism which causes appropriate rotation of the throttle valve in order to vary the value of said first pressure until said ratio equals said predetermined value.

3,646,601
OFF-ANGLE BALANCE CORRECTION METHOD AND APPARATUS

Joseph F. Lash, Ferndale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1969, Ser. No. 868,500
Int. Cl. G01n 1/22
U.S. Cl. 73—462 6 Claims

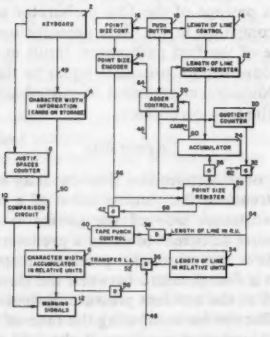


The amount and angle of unbalance of a rotary workpiece are measured and the position of unbalance is oriented between two angularly spaced correction drills. If the position of unbalance is not centered between the drills, then the drill depth at each location is compensated by a factor proportional to the product of the off-angle amount and the amount of unbalance.

3,646,602
PHOTOCOMPOSING MACHINE AND KEYBOARD HAVING LINE LENGTH CONVERSION FEATURE

Louis M. Moyroud, 202 Grove Way, Delray Beach, Fla.

Filed Dec. 24, 1968, Ser. No. 786,632
Claims priority, application Great Britain, Dec. 28, 1967, 58,756/67
Int. Cl. B41b 17/00
U.S. Cl. 95—4.5 R 4 Claims

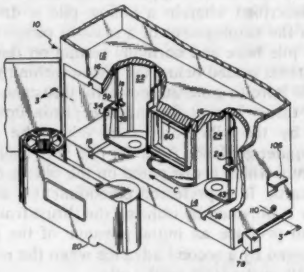


A photographic-type composing machine utilizing relative units for the representation of character widths, including a keyboard for the control of the machine, in which the selection of various point sizes does not affect the length of line, or the length of a line segment, produced in the photounit. The line length is selected in absolute units (such as picas, inches, or millimeters) at the keyboard, and is then automatically divided by a value representative of the point size selected, the quotient of the division representing the line length in relative units of the point size being used. The quotient is stored in the keyboard for justification purposes, and is also introduced into the controls for the photounit, for example, in the form of punched codes in a paper tape.

3,646,603
FOCAL PLANE SHUTTER AND MECHANISM FOR OPERATING

Wolfgang Ort, and Gerhard Brauning, both of Stuttgart-bad Connstatt, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 24, 1969, Ser. No. 809,590
Claims priority, application Germany, May 14, 1969, P 17 72 427.5
Int. Cl. G03b 9/36
U.S. Cl. 95—55 8 Claims



A focal plane shutter includes a pair of curtains formed of a one-piece member of readily flexible material having corrugations running in a direction perpendicular to the direction of curtain travel. The curtains are guided in opposed grooved of width substantially equal to the depth of the corrugations. The curtains ride in the grooves on a pair of pins and are driven by a pair of spring-biased transmission plates which are cocked by a tensioning lever and are latched in their cocked positions by a pair of armature levers. One of the armature levers is released by the tensioning lever while the other armature lever is released by a timing device after a delay period.

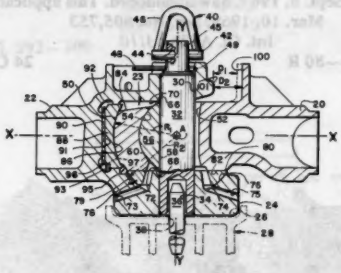
3,646,604
ARTICULATED RAILROAD CAR CONNECTION

Carl E. Tack, Elmhurst, and Loyal J. Rodgers, Kenilworth, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Apr. 7, 1969, Ser. No. 813,870
Int. Cl. B61f 3/12, 5/18; F16c 17/04
U.S. Cl. 105—4 R 12 Claims

An articulated car connection is provided with various im-

provements to reduce slack and to prevent undesirable interference between adjacent or abutting parts.

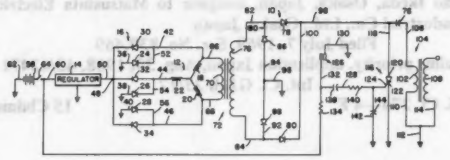


3,646,605

CAPACITOR-DISCHARGE IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Alfred Plume, Jr., Carson City, Nev., assignor to Mallory Electric Corporation, Detroit, Mich.

Filed Oct. 29, 1969, Ser. No. 872,306
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **2 Claims**



The capacitor-discharge ignition system is for use in connection with internal combustion engines which employ an alternator. The alternator functions in the usual manner to provide operating power for the electrical system usually associated with an internal combustion engine. A capacitor-discharge ignition circuit is connected across one phase of the output of the alternator in parallel with the usual electrical system. The alternator is utilized directly as a source of power for operation of the capacitor-discharge ignition system.

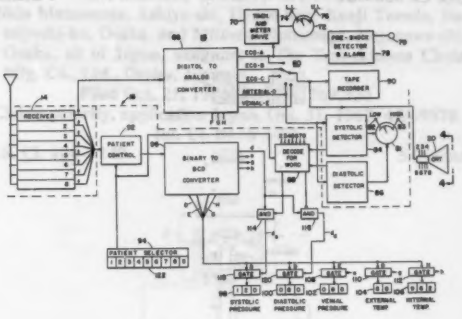
3,646,606

PHYSIOLOGICAL MONITORING SYSTEM

Richard L. Buxton, and George N. Miller, both of Huntsville, Ala., assignors to Care Electronics, Inc.

Filed Aug. 6, 1969, Ser. No. 847,946
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 R **3 Claims**

A physiological monitoring system for hospitalized patients wherein each of the patients monitored would be provided a patient monitoring unit which would electrically sense two or more physiological conditions, translate desired information into digital form and transmit it by pulse coded FM radio link to a central monitoring station. The central monitoring station would receive transmitted information from one or more patients so equipped and detect and display the information in analog and digital form and in some instances provide automatic alarms on the occurrence of certain predetermined values for the sensed conditions.

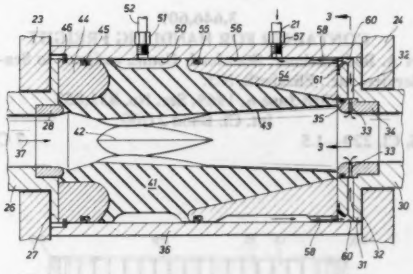


3,646,607

APPARATUS FOR CONTROLLING FLUID FLOW THROUGH A CONDUIT

Ethell J. Dower, Houston, Tex., assignor to Warren Automatic Tool Company, Houston, Tex.

Continuation-in-part of application Ser. No. 650,854, July 3, 1967, now Patent No. 3,479,001. This application Oct. 24, 1969, Ser. No. 869,244
Int. Cl. F16k *31/12;* **F16l** *55/14*
U.S. Cl. 137—604 **7 Claims**



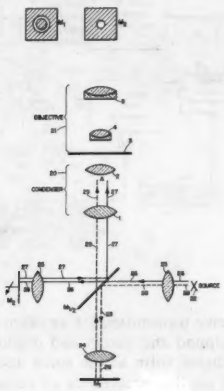
An apparatus for controlling the flow of fluid such as drilling mud through a conduit. It includes a housing arranged for fluid flow therethrough and is provided with a resilient generally tubular shaped flow controlling means, such as a rubber sleeve, mounted in the housing. The rubber sleeve is arranged for radial inward deformation to control the flow of mud therethrough. The apparatus includes means for flowing another fluid into the conduit at a point adjacent the downstream end of the rubber sleeve to reduce turbulence and cavitation to thereby extend the usable life of the apparatus and particularly the rubber sleeve.

3,646,608

PHASE CONTRAST MICROSCOPE ILLUMINATOR

Howard J. Rowland, Newton Highlands, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed June 10, 1969, Ser. No. 831,896
Int. Cl. G02b *21/06*
U.S. Cl. 350—87 4 Claims



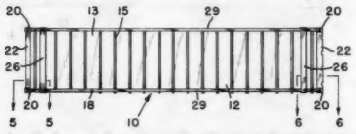
A phase contrast microscope illuminator in which a transparent stop positioned within a collimated light beam is focused upon a specimen plane aperture. In the absence of a specimen within the aperture, the objective field of the microscope objective lens system appears bright. A specimen actually within the aperture is illuminated by light from the focused beam. It is also illuminated by the focused phase shifted portion of the beam. Phase contrast is assured by varying the transmissivity of the stop. In this regard, the amplitude of the phase shifted portion of the light beam is set equal to the amplitude of the diffracted light entering the objective lens system. A planar reflector with a movable central portion serves as another embodiment of the invention.

3,646,609

CONTAINER FOR HANDLING FREIGHT

Bert A. Bodenheimer, Stamford, Conn., assignor to Sea-Land Service, Inc., Elizabeth, N.J.

Filed June 6, 1969, Ser. No. 831,057
Int. Cl. B65d *21/00*
U.S. Cl. 220—1.5 7 Claims



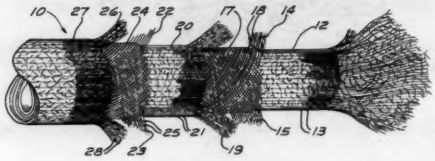
A container for handling freight in overland and marine transportation capable of being stacked with other containers is superposed relation. Strong points are provided at the corners and intermediate the corners of the containers for stacking mixed lengths of containers and to facilitate handling with a single lifting spreader suited to the shortest length container of the mixed stack.

3,646,610

FIBER GLASS REINFORCED GOLF SHAFT

Carl Thomas Jackson, Fairview, Pa., assignor to True Temper Corporation, Cleveland, Ohio

Continuation-in-part of application Ser. No. 475,112, July 27, 1965, now abandoned , and a continuation-in-part of 666,342, Sept. 8, 1967, now abandoned. This application Mar. 10, 1969, Ser. No. 805,753
Int. Cl. A63b *53/10*
U.S. Cl. 273—80 R 24 Claims



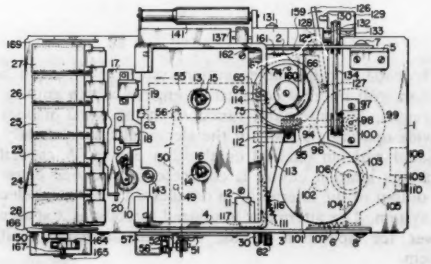
A fiber glass reinforced golf shaft has layers of fiber glass strands disposed longitudinally or both longitudinally and circumferentially of the shaft and enclosed in a resinous binder, some or all of the layers being provided with a layer of random-oriented, short lengths of chopped, fiber glass filament which are also enclosed within said resinous binder.

3,646,611

MAGNETIC TAPE RECORDING AND REPRODUCING DEVICE

Hisao Ikeda, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 7, 1969, Ser. No. 839,469
Claims priority, application Japan, Aug. 30, 1968, 43/62471
Int. Cl. G11b *23/12*
U.S. Cl. 274—4 F 15 Claims



A novel mechanism in which a plurality of stacked cassettes housed in a cassette housing can be automatically played in succession in such a manner that when the play of a cassette which has first been brought into the play position is completed the cassette is discharged out of the cassette housing and the next cassette is brought into the play position.

3,646,612

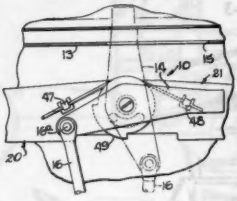
OVEN DOOR LATCH

Donald L. Anderson, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Continuation-in-part of application Ser. No. 754,174, Aug. 21, 1968, now abandoned. This application Oct. 15, 1969, Ser. No. 871,472

Int. Cl. E05c 3/10

U.S. Cl. 292—200 14 Claims



A latching device for an oven door for use during the high-heat cycle of a self-cleaning oven. A latch is moved between latched and unlatched positions by a mechanism which is movable from a normal position to an actuating position to move the latch to the latched position and is movable from the normal position to an operating position to move the latch to the unlatched position. So that the mechanism can return to the normal position after moving the latch while leaving the latch in the moved position, the mechanism is connected to the latch by a lost motion connection. In one embodiment, the mechanism comprises two levers with one lever for moving the latch from the unlatched position to the latched position and the other for moving the latch from the latched position to the unlatched position. The mechanism comprises a single handle in the second embodiment.

3,646,613

AUTOMATIC CARRYING SYSTEM

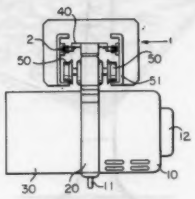
Mikio Matsumoto, Ashiya-shi, Hyogo-ken; Kenji Terada, Sumiyoshi-ku, Osaka, and Mitsuru Matsunaga, Neyagawa-shi, Osaka, all of Japan, assignors to The Tsubakimoto Chain Mfg. Co., Ltd., Osaka, Japan

Filed Oct. 21, 1968, Ser. No. 769,320

Claims priority, application Japan, Oct. 31, 1967, 42/69578

Int. Cl. B61b 3/02

U.S. Cl. 104—149 3 Claims

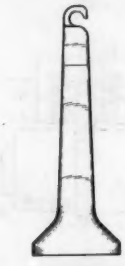


An automatic carrying system for carrying loads from any place to any location along particular formed rails provided with power supply lines. This system includes an automatic carrying apparatus adapted to run on the rail with loads to be conveyed, a section control apparatus for controlling the operation of the carrying apparatus so as not to permit the successive carrying apparatus to collide each other, a branching and joining apparatus for the carrying apparatus, a turnable directioning apparatus for turning the direction of the carrying apparatus, and accessories for controlling the operation of the carrying apparatus.

DESIGNS

FEBRUARY 29, 1972

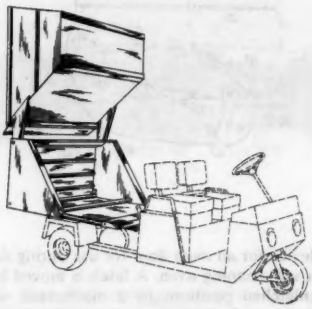
223,017
PAINT BRUSH HANDLE
John A. Pharris, Brookfield, and Albert A. Mlachnik, Greendale, Wis., assignors to EZ Paintr Corporation
Filed Sept. 25, 1970, Ser. No. 25,203
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38



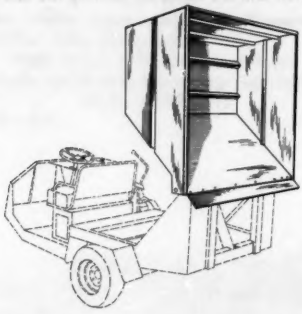
223,018
PAINT BRUSH HANDLE
John A. Pharris, Brookfield, and Albert A. Mlachnik, Greendale, Wis., assignors to EZ Paintr Corporation
Filed Sept. 25, 1970, Ser. No. 25,204
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38

223,019
BOTTLE
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Jan. 18, 1971, Ser. No. 107,604
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125

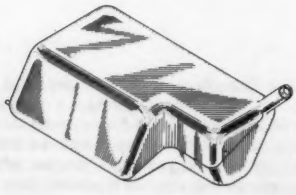
223,020
DUMP BODY FOR A SMALL TRUCK
Roy F. Broyhill, Dakota City, Nebr. 68731
Filed July 15, 1970, Ser. No. 23,961
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3



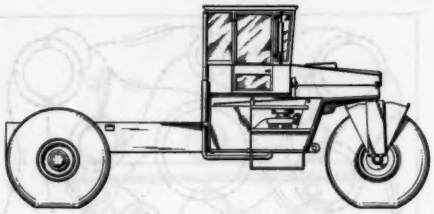
223,021
DUMP BODY FOR A SMALL TRUCK
Roy F. Broyhill, Dakota City, Nebr. 68731
Filed July 23, 1970, Ser. No. 24,083
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3



223,022
VEHICULAR TANK FOR FUEL OR THE LIKE
James M. Yates, 908 Deer Ridge, Waco, Tex. 76710
Filed Nov. 16, 1970, Ser. No. 26,002
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3



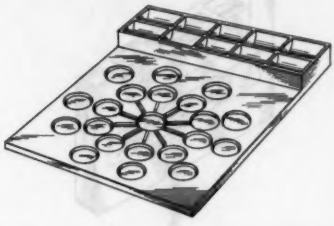
223,023
TRUCK
Verner E. Bergman, 4042 Wanamaker Road, Topeka, Kans. 66610
Filed Dec. 4, 1970, Ser. No. 26,286
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



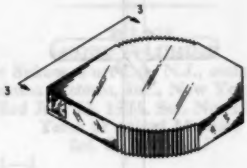
223,024
ANTI-BOUNCE CONTROL ARM INSERT FOR AUTOMOBILE REAR-END SUSPENSION SYSTEM
Hudson Thomas, 777 Hamilton St., Costa Mesa, Calif. 92627
Filed Apr. 13, 1970, Ser. No. 22,411
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

223,025
CHAIR
Chester J. Barecki, Grand Rapids, and Carl W. Sundberg and Montgomery Ferar, Southfield, Mich., assignors to American Seating Company, Grand Rapids, Mich.
Filed June 5, 1970, Ser. No. 23,332
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—8

223,026
EDUCATIONAL BOARD FOR TEACHING CHILDREN WITH DISABILITIES
Johanna R. Rotkow, 735 55th St., Des Moines, Iowa 50312
Filed Oct. 23, 1970, Ser. No. 25,627
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1

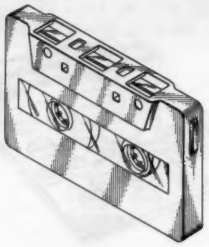


223,027
TAPE CARTRIDGE
William A. Sours, Sauquoit, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.
Filed Jan. 8, 1970, Ser. No. 105,147
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—14



223,028
PORTABLE SPEAKER ENCLOSURE
Augustine J. Sperrazza, 324–A Liberty Road, Troy, N.Y. 12180
Filed Aug. 20, 1970, Ser. No. 24,590
Term of patent 14 years
Int. Cl. D14—*03*; D6—*01*
U.S. Cl. D26—14

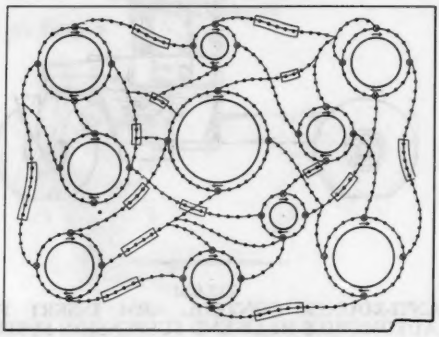
223,029
MAGNETIC TAPE CASSETTE
Reinhold M. Weiss, Chicago, and T. Michael Dennehey, La Grange, Ill., assignors to Memorex Corporation
Filed Oct. 2, 1970, Ser. No. 25,306
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



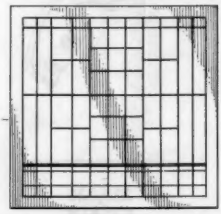
223,030
WEDDING CAKE ORNAMENT
Geza Dombi, 4060 Carlock Drive, Boulder, Colo. 80303
Filed June 1, 1970, Ser. No. 23,217
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—24

223,031
GOLF PUTTER HEAD
Leo J. Ernst, Los Angeles, Calif. (18640 Superior St., Northridge, Calif. 91324)
Filed Apr. 23, 1970, Ser. No. 22,600
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

223,032
GAME BOARD
Matilda Corey, 3208 Arsenal St., St. Louis, Mo. 63118, and Joseph Paul Courry, Garden Grove, Calif.; said Courry assignor to said Corey
Filed Aug. 31, 1970, Ser. No. 24,760
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

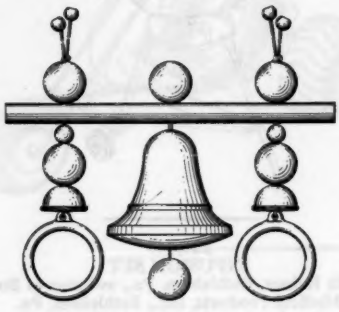


223,033
GAME BOARD
Mary Everett Oldham, 413 N. Sycamore St., Mount Sterling, Ky. 40353
Filed Dec. 16, 1970, Ser. No. 26,533
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

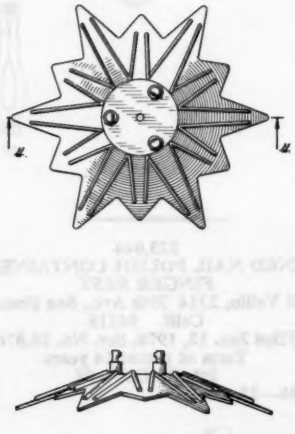


223,034
TOY DUMP TRUCK
Wesley E. Sharer, Chicago, Ill., assignor to Playskool, Inc., Chicago, Ill.
Filed Aug. 27, 1970, Ser. No. 24,726
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

223,035
NURSERY GYM
Irving Brecher, 5 Greenacre Court, Great Neck, N.Y. 11021
Filed Oct. 6, 1970, Ser. No. 25,355
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

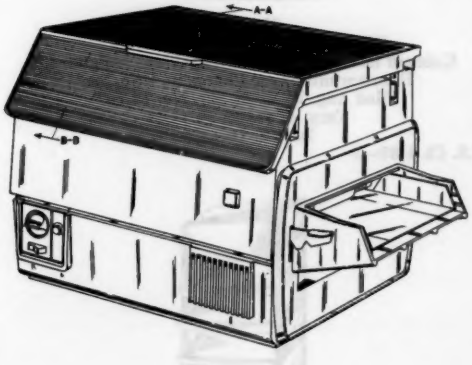


223,036
HOT WATER DEFLECTOR FOR A COFFEE URN
John C. Martin and Eugene G. Rescho, Springfield, Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Aug. 14, 1970, Ser. No. 24,502
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—26

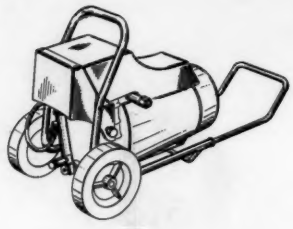


223,037
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jan. 8, 1971, Ser. No. 105,154
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

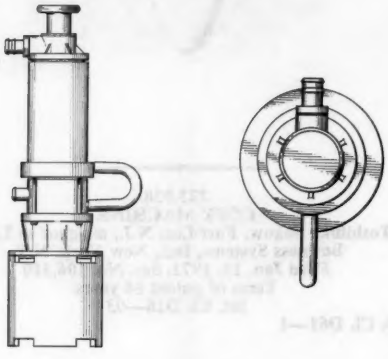
223,038
COPY MACHINE
Toshihiko Sakow, Fort Lee, N.J., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Jan. 13, 1971, Ser. No. 106,310
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1



223,039
PORTABLE PUMPING UNIT
Stanley W. Widmer, Coon Rapids, Minn., assignor to Graco Inc., Minneapolis, Minn.
Filed Nov. 10, 1969, Ser. No. 20,020
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1



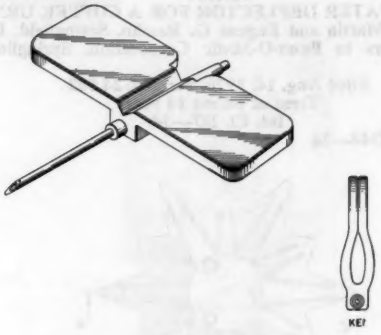
223,040
COMBINATION MOTOR, PUMP, AND FILTER
Walter J. Otto, Wantagh, N.Y., assignor to Julius L. Englesberg, Freeport, N.Y.
Filed Sept. 17, 1970, Ser. No. 25,316
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1



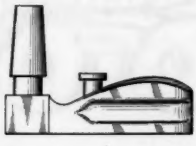
223,041
MODULAR DISPLAY STAND
Kenneth Kuenster, New Haven, Conn., assignor to Hammermill Paper Company, Erie, Pa.
Filed Aug. 26, 1970, Ser. No. 24,707
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9

223,042
PORTABLE OUTDOOR COOKER
Judkins E. Wilkinson and Clarence R. Smith, Birmingham, Ala., assignors to Atlanta Stove Works, Inc.
Filed Dec. 4, 1970, Ser. No. 26,296
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10

223,043
INFUSION SET
Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Products, Inc., Bethlehem, Pa.
Continuation-in-part of design applications Ser. No. 22,700, Apr. 29, 1970, Ser. No. 22,710, Apr. 29, 1970, Ser. No. 22,711, Apr. 29, 1970, and Ser. No. 22,712, Apr. 29, 1970. This application Nov. 19, 1970, Ser. No. 26,078
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

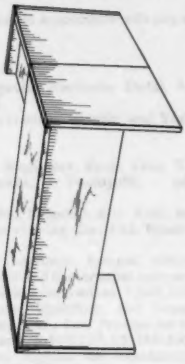


223,044
COMBINED NAIL POLISH CONTAINER AND FINGER REST
Elliott Yellin, 2314 39th Ave., San Francisco, Calif. 94116
Filed Jan. 12, 1970, Ser. No. 20,876
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10



223,045
THREE-WHEELED POWERED VEHICLE
William S. Stull, Los Angeles County, Calif. (15214 Midcrest Drive, Whittier, Calif. 90604)
Filed Sept. 16, 1970, Ser. No. 25,020
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D90—8

223,046
DESK
John Nance, Quakertown, Pa., assignor to JG Furniture Company, Inc., New York, N.Y.
Filed June 17, 1970, Ser. No. 23,527
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—7



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF FEBRUARY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Carter, Sidney T., 3,645,303.

Abbott Laboratories: *See—*
Harrigan, Robert Emmet, 3,645,262.

Abdallah, Abdulmuniem H., to Dow Chemical Company, The. Triazine anorectic method. 3,646,204, Cl. 424-249.

Abe, Hiroshi; Shigeta, Yukio; Uchimaru, Fumihiko; Okada, Seizaburo; and Kosasayama, Akira, to Daiichi Seiyaku Company, Limited. 2-Morphalino carbonyl pyrazines. 3,646,031, Cl. 260-247.5

Abe, Michio, to Tokai Cold Forming Co., Ltd. Method of making ball studs from metal rods. 3,644,973, Cl. 29-149.5

Abel, Bernard: *See—*
Birr, Jacques; Abel, Bernard; and Charbonnier, Patrice,3,645,798.

Abraham, Anton, 1/2 to Wiener Kammfabrik Anton Abraham Komm. Ges. Hair securing means, particularly a hair-clasp or barrette, or a hair-comb with such securing means. 3,645,278, Cl. 132-48.

Abrams, Andrew M., to Union Camp Corporation. Box structure convertible into an easel. 3,645,382, Cl. 206-45.21

Abramson, Carl N.: *See—*
Nadir, Mark T.; and Abramson, Carl N.,3,646,273.
Nadir, Mark T.; and Abramson, Carl N.,3,646,274.

Acker, Morris; Ikrath, Kurt; and Schneider, Wilhelm A., to United States of America, Navy. Helical coil coupled to a live tree to provide a radiating antenna. 3,646,562, Cl. 343-720.

Acme Highway Products Corporation: *See—*
Berchou, William J., 3,645,176.

Acme Spring Company: *See—*
Swatt, Leonard W., 3,644,946.

Acre, Thomas R.; Gimbel, Frederick M.; Ramachandran, Sundaresan; and Beck, Thomas F., to Allegheny Ludlum Industries, Inc. Consumable lance. 3,645,520, Cl. 266-34.

Actor, Philip Paul; and Pellerano, Cesare Enrico Guiseppe, to Kline, Smith & French Laboratories. Anticestode hydrazinoquinolines. 3,646,019, Cl. 260-240.

Adaev, Evgeny Ivanovich; Blinov, Alexandr Vasilievich; and Kamarian, Georgy Mikirtychevich. Device for setting cathodes in electrolyzers. 3,645,878, Cl. 204-243.

Adam, Marie Henri Hubert. Discharge tube assembly. 3,646,340, Cl. 240-11.4

Adams, Frederick J., to Cam Gears Limited. Sealing rings. 3,645,542, Cl. 277-1.

Adams, Frederick John, to Cam Gears Limited. Power-assisted steering and like systems. 3,645,296, Cl. 137-625.69

Adams, George F., Sr. Angle guide for electric saw and router. 3,645,306, Cl. 143-6.

Adaptive Technology, Inc.: *See—*
Nadir, Mark T.; and Abramson, Carl N., 3,646,273.
Nadir, Mark T.; and Abramson, Carl N., 3,646,274.

Addin, Leo. Method of growing pear trees from slips. 3,645,041, Cl. 47-58.

Addressograph-Multigraph Corporation: *See—*
Di Giulio, Albert J.; and Naujokas, Frank B., 3,645,157.
Lake, Francis K., 3,645,202.

Advance Transformer Co.: *See—*
Hasson, Sol; and Freegard, Ernest M., 3,646,401.

Advanced Technology Center, Inc.: *See—*
Farmer, Bobby Joe; and Johnson, Jim Howard, 3,646,347.

AEG-Elotherm GmbH: *See—*
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Aerojet-General Corporation: *See—*
Doherty, Alfred E., Jr.; and Knop, Louis H., 3,645,435.
Frankel, Milton B.; Gold, Marvin H.; and Marcus, Henry J., 3,646,228.

Aeroplane and Motor Aluminum Castings Limited: *See—*
Brown, Warwick N.; and Robinson, Peter M., 3,645,491.

Aeroquip Corporation: *See—*
Allread, Alan R., 3,645,294.
Reinker, Joseph F., Jr., 3,645,567.

AFE Industries, Inc.: *See—*
Alms, Erhard E.; and Mitchell, James E., 3,645,511.

Agfa-Gevaert Aktiengesellschaft: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Schweicher, Wolfgang; Wasser, Willi; Browatski, Kurt; and Friedsam, Josef, 3,645,773.
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Ahlrich, Willard K. Baffled ventilating hood. 3,645,194, Cl. 98-115.

Air Products and Chemicals, Inc.: *See—*
Lindemann, Martin K.; and Volpe, Rocco P., 3,645,952.

Air Reduction Company, Incorporated: *See—*
Lewis, John G., 3,646,240.

Ajinomoto Co., Inc.: *See—*
Ito, Kenkichi; Mizoguchi, Naomasa; Dazai, Miyoji; and Sato, Osahiro, 3,646,082.
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Akagi, Saburo: *See—*
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Akazawa, Hakuichi; Washio, Shigeaki; Kaji, Keiji; and Fujita, Shisao, to Taki Fertilizer Manufacturing Co., Ltd. Production of gypsum. 3,645,677, Cl. 23-122.

Akerstrom, Stig Hjalmar Johannes; Tempel, Albert; and Gullfeldt, Bengt Hjalmar. Fungicidal and bactericidal composition and method containing 3-thiocyanoindole derivatives. 3,646,210, Cl. 424-274.

Akiyama, Shinichi; Minami, Shoichiro; and Toyoda, Akinobu, to Japanese Geon Company, Ltd., The. Process for the preparation of unsaturated carboxylic acid. 3,646,127, Cl. 260-530.

Akre, Marvin L. Closure support for foundation vents and like openings. 3,645,044, Cl. 49-465.

Akroyd, P. R., Limited: *See—*
Akroyd, Peter Robert, 3,645,217.

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Aktiebolaget Astra: *See—*
Eriksson, Axel Fredrik Valdemar; Svard, Per Olov; and Jurgens, Jorg, 3,646,195.

Alaimo, Robert J., to Norwich Pharmacal Company, The. 2,3-Dihydro-2-(5-nitro-2-thienyl)quinazolin- 4(1H)ones. 3,646,034, Cl. 260-251.

Albright, Jay Donald: *See—*
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Aldana, Roberto: *See—*
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Aldred, Edward John, to Ransomes Sims & Jefferies Limited. Flail mower. 3,645,076, Cl. 56-294.

Aldrich Chemical Company, Inc.: *See—*
Bader, Henry; and Biel, John H., 3,646,014.

Aldrich, Paul E., to Du Pont de Nemours, E. I., and Company. 5-Aryloxatricyclo[3.2.2.0^{24}]nonane-1-amines. 3,646,070, Cl. 260-348.

Aldropp, Archie: *See—*
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Alexander, Norman E.: *See—*
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Allen, Richard W., to Singer Company, The. Escapement mechanism. 3,645,373, Cl. 197-82.

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Allied Chemical Corporation: *See—*
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Allread, Alan R., to Aeroquip Corporation. Self-sealing coupling. 3,645,294, Cl. 137-614.03

Alms, Erhard E.; and Mitchell, James E., said Mitchell, assor. to AFE Industries, Inc. Pilot for gas burner. 3,645,511, Cl. 263-19.

Alps Electric Co., Ltd.: *See—*
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Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, 3,646,048.
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Amtsberg, Lester A.; and Wallace, William K., to Chicago Pneumatic Tool Company. Pneumatic nut-runner having a torque sensing device. 3,645,341, Cl. 173-12.
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Anaconda Wire and Cable Company: *See—*
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Anderson, Jimmy J. Valve stem extractor-inserter. 3,644,982, Cl. 29-213.
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Anderson, Robert F. Indicating means for golf club cover and the like. 3,645,022, Cl. 40-10.
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Andersons, The: *See—*
Anderson, Robert J., 3,645,006.
Ando, Shinji: *See—*
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240 3,644,964

CLASS 23
2SQ 3,645,671
51 3,645,672
102A 3,645,673
106 3,645,674
3,645,675
109 3,645,676
122 3,645,677
153 3,645,678
3,645,679
3,645,680
3,645,681
165 3,645,682
177 3,645,683
182V 3,645,684
209.4 3,645,685
223.5 3,645,686
230B 3,645,688
3,645,692
230R 3,645,687
3,645,689
3,645,690
3,645,691
3,645,693
232R 3,645,694
252R 3,645,695
253TP 3,645,696
253A 3,645,697
253R 3,645,698
273F 3,645,699
284 3,645,700
288M 3,645,701
367 3,645,702

CLASS 24
90R 3,644,965
134QA 3,644,966
230AK 3,644,967

CLASS 28
1.2 3,644,968
72.14 3,644,969

CLASS 29
25.18 3,644,970
148.4C 3,644,971
149.5B 3,644,973
149.5 3,644,972
157 3,644,974
157.3V 3,644,975
157.4 3,644,976
182.5 3,645,703
200P 3,644,977
202R 3,644,978
203B 3,644,979
3,644,980
207.5SL 3,644,981
213 3,644,982
401 3,644,983
421 3,644,984
481 3,644,985
487 3,646,591
593 3,644,986
599 3,644,987
3,644,988
628 3,644,989

CLASS 30
34.1 3,644,990
34.2 3,644,991
64 3,644,992
280 3,644,993
292 3,644,994

CLASS 32
2 3,644,995
3,644,996
3 3,644,997
61 3,644,998

CLASS 33
23C 3,644,999
137 3,645,000
162 3,645,001
172R 3,645,002
192 3,645,003

CLASS 34
9 3,645,004
22 3,645,005
3,645,006
60 3,645,007
81 3,645,008
104 3,645,009
133 3,645,010

CLASS 35
9C 3,645,013
9D 3,646,592
9R 3,645,012
12K 3,645,014
12P 3,645,011
14 3,645,015
50 3,645,016

CLASS 36
2.5AL 3,645,017
58.5 3,646,497

CLASS 37
58 3,645,018
82 3,645,019
91 3,645,020
141 3,645,021

CLASS 40
10 3,645,022
21C 3,645,023
124.1 3,645,024
152 3,645,025
218 3,645,026

CLASS 42
77 3,645,027

CLASS 43
17 3,645,028
3,645,029
26.1 3,645,030
26.2 3,645,033
44.2 3,645,031
44.9 3,645,032
105 3,645,034

CLASS 44
7.5 3,645,705
62 3,645,704

CLASS 46
17 3,645,035
23 3,645,036
66 3,645,037
151 3,645,038
206 3,645,039

CLASS 47
1.4 3,645,040
58 3,645,041

CLASS 49
326 3,645,042
370 3,645,043
465 3,645,044
504 3,645,045

CLASS 51
5 3,645,046
92R 3,645,047
165R 3,646,593
281 3,645,048
295 3,645,706
334 3,645,049
338 3,645,050

CLASS 52
28 3,645,051
64 3,645,052
65 3,645,053
126 3,645,054
157 3,645,055
259 3,645,056
295 3,645,057
456 3,645,058
609 3,645,059

CLASS 53
24 3,645,060
25 3,645,061
28 Re.27,302
42 3,645,062
53 3,645,063
55 3,645,064
73 3,645,065
112A 3,645,066
124B 3,645,067
159 3,645,069
186 3,645,068

CLASS 55
59 3,646,594
230 3,645,070
259 3,645,071
284 3,646,595
387 3,645,072

CLASS 56
13.8 3,645,073
14.6 3,645,074
28 3,645,075
294 3,645,076
366 3,645,077

CLASS 57
24 3,645,078
34AT 3,645,079
34HS 3,645,081
34R 3,645,080
77.45 3,645,082
88 3,645,083
3,645,084
140 3,645,085

CLASS 58
4 3,645,086
6A 3,645,087
23A 3,645,088
28D 3,645,089
58 3,645,090

CLASS 60
26.1 3,645,091
39.28 3,645,094
39.36 3,645,095
39.66 3,645,096
52HE 3,646,596
52SR 3,645,097
251 3,646,597
272 3,645,092
288 3,645,098
303 3,645,093

CLASS 61
1F 3,645,099
13 3,645,100
35 3,645,101
42 3,645,102
46.5 3,645,103
3,645,104
53.5 3,646,598
72.3 3,645,105

CLASS 62
9 3,645,106
183 3,645,107
187 3,645,108
196 3,645,109
217 3,645,110
498 3,645,111
505 3,645,112
514 3,645,113

CLASS 64
14 3,645,114
17A 3,645,115

CLASS 65
3 3,645,707
19 3,645,708
27 3,645,709
30 3,645,710
33 3,645,711
83 3,645,712
99A 3,645,713

CLASS 68
5E 3,645,116
140 3,645,117

CLASS 69
6.5 3,645,118

CLASS 71
23 3,645,714
67 3,645,715
113 3,645,716

CLASS 72
90 3,645,119
134 3,645,120
147 3,646,599
205 3,645,121
237 3,645,122
286 3,645,123
377 3,645,124
391 3,645,125
402 3,645,126

CLASS 73
40.7 3,645,127
49.3 3,645,128
67 3,645,129
95 3,645,130
118 3,646,600
153 3,645,131
189 3,645,132
204 3,645,133
338 3,645,134
393 3,645,136
398C 3,645,135
3,645,137
401 3,645,138
406 3,645,139
407R 3,645,140
420 3,645,141
425.6 3,645,142
462 3,646,601

CLASS 74
14 3,645,143
89.2 3,645,144
89.21 3,645,146
375 3,645,147
423 3,645,148
473R 3,645,145
3,645,149
501P 3,645,150
551.9 3,645,151
682 3,645,152
700 3,645,153

CLASS 75
33 3,645,717
58 3,645,720
60 3,645,718
94 3,645,719
123J 3,645,721
124 3,645,722
3,645,723
126C 3,645,724
128A 3,645,725
171 3,645,726
175.5 3,645,727
214 3,645,728

CLASS 82
40 3,645,154

CLASS 83
9 3,645,156
205 3,645,157
492 3,645,158
599 3,645,159
663 3,645,155

CLASS 84
1.03 3,646,241
3,646,242

CLASS 85
1SS 3,645,161
4 3,645,162
5R 3,645,160
13 3,645,163
17 3,645,164

CLASS 89
11 3,645,165
26 3,645,166

CLASS 91
31 3,645,167
189 3,645,168
268 3,645,169
399 3,645,170
487 3,645,171
497 3,645,172

CLASS 92
92 3,645,173
193 3,645,174

CLASS 93
1C 3,645,175

CLASS 94
18 3,645,176
33 3,645,177

CLASS 95
1 3,645,178
3,645,179
4.5R 3,646,602
4.5 3,645,180
10CT 3,645,181
11 3,645,188
11.5R 3,645,189
31AC 3,645,182
31FM 3,645,183
45 3,645,184
53EB 3,645,185
53R 3,645,190
55 3,646,603
59 3,645,186
62 3,645,187

CLASS 96
1 3,645,729
28 3,645,730
29 3,645,731
36 3,645,732
3,645,733
36.1 3,645,734
48 3,645,736
55 3,645,737
61 3,645,738
67 3,645,735
3,645,739
87R 3,645,740
91 3,645,741
100 3,645,742
111 3,645,743
115 3,645,744

CLASS 98
36 3,645,191
75 3,645,192
94 3,645,193
115 3,645,194
121 3,645,195

CLASS 99
17 3,645,745
3,645,746
3,645,747
100 3,645,748
116 3,645,751
126 3,645,752
140R 3,645,753
3,645,754
3,645,755
3,645,756
171CA 3,645,757
172 3,645,758
174 3,645,759
176 3,645,760
404 3,645,196
450.4 3,645,197

CLASS 100
35 3,645,198
70R 3,645,199
98 3,645,200

CLASS 101
38A 3,645,201
148 3,645,202
228 3,645,203
401.1 3,645,204

CLASS 102
24 3,645,205
40 3,645,206
3,645,207
66 3,645,208

CLASS 104
12 3,645,209
149 3,646,613

CLASS 105
4R 3,646,604
163R 3,645,210
215C 3,645,211
354 3,645,212
362 3,645,213
369B 3,645,214

CLASS 106
1 3,645,749
53 3,645,761
89 3,645,762
90 3,645,763
96 3,645,764
104 3,645,750
307 3,645,765

CLASS 108
51 3,645,215

CLASS 109
82 3,645,216

CLASS 110
8A 3,645,217
8R 3,645,218

CLASS 112
80 3,645,219
218R 3,645,220
221 3,645,221
224 3,645,222

CLASS 114
66.5H 3,645,223
235B 3,645,224
235R 3,645,225

CLASS 116
70 3,645,226
128 3,645,227

CLASS 117
3 3,645,766
5.1 3,645,767
8 3,645,768
16 3,645,769
17.5 3,645,770
33.3 3,645,771
34 3,645,772
3,645,773
46CA 3,645,774
63 3,645,775
64 3,645,776
71R 3,645,777
93.4 3,645,778
106R 3,645,779
138.8F 3,645,780
141 3,645,781
205 3,645,782
212 3,645,783
215 3,645,784
217 3,645,785
221 3,645,786
239 3,645,787
3,645,788

CLASS 118
2 3,645,228
48 3,645,229
49.5 3,645,230

50.1 3,645,231
412 3,645,232
642 3,645,233

CLASS 119

18 3,645,234
51R 3,645,235
81 3,645,236

CLASS 122

4D 3,645,237
235G 3,645,238

CLASS 123

8.07 3,645,239
32EA 3,645,240
102 3,645,241
119B 3,645,242
122A 3,645,243
136 3,645,244
140FG 3,645,245
148E 3,645,246
3,646,605
179SE 3,645,247

CLASS 126

39E 3,645,248
39H 3,645,249
59.5 3,645,250
359 3,645,251

CLASS 128

2F 3,645,252
3,645,253
2.06R 3,646,606
23 3,645,254
24A 3,645,255
57 3,645,256
60 3,645,257
130 3,645,258
133 3,645,259
145.5 3,645,261
172.1 3,645,260
222 3,645,262
263 3,645,263
296 3,645,264
303.13 3,645,265
305 3,645,266
347 3,645,268
421 3,645,267

CLASS 130

26 3,646,373
27JT 3,645,269
27T 3,645,270
30R 3,645,271

CLASS 131

21R 3,645,272
84B 3,645,273
198R 3,645,274

CLASS 132

5 3,645,275
3,645,276
33G 3,645,277
48 3,645,278
53 3,645,279
3,645,280
88.7 3,645,281

CLASS 134

2 3,645,789
3 3,645,790
25A 3,645,791
45 3,645,282
58DL 3,645,283
166R 3,645,284

CLASS 136

6 3,645,792
24 3,645,793
86A 3,645,794
3,645,795
86D 3,645,796

CLASS 137

54 3,645,285
68 3,645,286
219 3,645,287
255 3,645,288
454.2 3,645,289
494 3,645,290
588 3,645,291
599.1 3,645,292
604 3,646,607
608 3,645,293
614.03 3,645,294
624.13 3,645,295
625.69 3,645,296
637.3 3,645,297

CLASS 138

40 3,645,298

CLASS 139

11 3,645,299
308 3,645,300

CLASS 140

93.2 3,645,302

CLASS 141

7 3,645,303
68 3,645,301
198 3,645,305

CLASS 143

6G 3,645,306
3,645,307
160 3,645,304

CLASS 144

176 3,645,308
326 3,645,309

CLASS 146

115 3,645,310

CLASS 148

2 3,645,799
6.15R 3,645,797
6.15Z 3,645,806
9.5 3,645,798
11.5 3,645,800
12 3,645,801
15 3,645,802
127 3,645,803
128 3,645,804
156 3,645,805
187 3,645,807
3,645,808

CLASS 149

38 3,645,809
43 3,645,810

CLASS 151

41.75 3,645,311

CLASS 152

158 3,645,312
209R 3,645,313
209 3,645,314
383 3,645,315
410 3,645,316

CLASS 156

5 3,645,811
17 3,645,812
62.4 3,645,813
62.8 3,645,814
69 3,645,815
94 3,645,816
108 3,645,817
128 3,645,818
148 3,645,819
191 3,645,820
196 3,645,821
243 3,645,822
247 3,645,823
322 3,645,824
361 3,645,825
401 3,645,826
3,645,827
402 3,645,828
441 3,645,829
510 3,645,830
527 3,645,831
541 3,645,832

CLASS 160

168 3,645,317
348 3,645,318

CLASS 161

57 3,645,833
92 3,645,834
146 3,645,835
151 3,645,836
160 3,645,837
164 3,645,838
193 3,645,839

CLASS 162

78 3,645,840
166 3,645,841
303 3,645,842
347 3,645,843
352 3,645,844

CLASS 164

72 3,645,319
160 3,645,320
252 3,645,321
281 3,645,322
282 3,645,323
388 3,645,324

CLASS 165

27 3,645,325
48 3,645,326
51 3,645,327
105 3,645,329
151 3,645,330

CLASS 166

75 3,645,332
85 3,645,328
3,645,333
120 3,645,334
179 3,645,335
288 3,645,336

CLASS 169

14 3,645,337
16 3,645,338

CLASS 171

61 3,645,339

CLASS 172

804 3,645,340

CLASS 173

12 3,645,341
17 3,645,342
43 3,645,343
49 3,645,344

CLASS 174

15 3,646,243
21JS 3,646,245
57 3,646,244
68.5 3,646,246
3,646,572
117M 3,646,247
120SC 3,646,248
126 3,646,249
138F 3,646,250
142 3,646,251

CLASS 175

56 3,645,345
65 3,645,331
237 3,645,346

CLASS 178

4.1R 3,646,573
5.4HE 3,646,253
5.4SD 3,646,252
5.4P 3,646,254
6 3,646,255
3,646,256
3,646,257
6.6DD 3,646,259
3,646,261
6.6A 3,646,258
3,646,260
6.7R 3,646,262
6.8 3,646,263
3,646,264
7.2 3,646,265
3,646,267
7.85 3,646,266
25 3,646,268
69.5R 3,646,269

CLASS 179

1SA 3,646,576
1D 3,646,270
1G 3,646,574
6.3R 3,646,575
15AP 3,646,272
15BA 3,646,271
3,646,273
3,646,274
18GE 3,646,276
18E 3,646,275
18J 3,646,277
100.11 3,646,278
100.41K 3,646,279
111E 3,646,280
111R 3,646,281

CLASS 180

5R 3,645,348
5 3,645,347
6.48 3,645,349
9.2R 3,645,350
54C 3,645,351
82 3,645,352
90 3,645,353

CLASS 181

23 3,645,354
31B 3,645,355
32R 3,645,356
36B 3,645,357
36R 3,645,358

CLASS 182

2 3,645,359

CLASS 184

6.18 3,645,360

CLASS 187

29R 3,645,361

CLASS 188

71.8 3,645,362
184 3,645,363
196D 3,645,364
285 3,645,365

CLASS 191

12R 3,646,282

CLASS 192

.08 3,645,366
4A 3,645,367
4C 3,645,368

CLASS 193

43B 3,645,369

CLASS 194

9T 3,645,370

CLASS 195

4 3,645,845
28R 3,645,846
30 3,645,847
31R 3,645,848
62 3,645,849
66R 3,645,850
3,645,851
68 3,645,852
103.5R 3,645,853

CLASS 197

1 3,645,371
18 3,645,372
82 3,645,373
97 3,645,374

CLASS 198

19 3,645,375
27 3,645,376
33AB 3,645,377
38 3,645,378
127 3,645,379
219 3,645,380
220CA 3,645,381

CLASS 200

5EB 3,646,283
18 3,646,287
48R 3,646,284
48 3,646,288
61.08 3,646,285
3,646,286
61.47 3,646,289
67D 3,646,290
70 3,646,291
82B 3,646,292
84C 3,646,293
144B 3,646,294
148J 3,646,295
150R 3,646,296
153LB 3,646,297
157 3,646,298
162 3,646,299
166BH 3,646,301
166D 3,646,300
168E 3,646,302
177 3,646,303

CLASS 201

39 3,645,854

CLASS 204

16 3,645,855
28 3,645,856
3,645,857
34 3,645,858
35N 3,645,859
35R 3,645,860
49 3,645,861
56R 3,645,862
59 3,645,863
74 3,645,864
96 3,645,865
99 3,645,866
130 3,645,867
158HA 3,645,868
159.12 3,645,869
159.17 3,645,870
181 3,645,871
3,645,872
3,645,873
3,645,874
195 3,645,875
211 3,645,876
224 3,645,877
243R 3,645,878
247 3,645,879
278 3,645,880
286 3,645,881
300 3,645,883
301 3,645,882
3,645,884

CLASS 206

45.21 3,645,382
45.34 3,645,384
51 3,645,383
52R 3,645,385
59F 3,645,386
60 3,645,387
62R 3,645,388
3,645,389
84 3,645,390

CLASS 208

8 3,645,885
48AA 3,645,886
96 3,645,887
139 3,645,888
308 3,645,889

CLASS 209

73 3,645,391
74M 3,645,392
80.5 3,645,393
82 3,645,394
91 3,645,395
97 3,645,396
464 3,645,397

CLASS 210

23 3,645,890
3,645,891
44 3,645,892
50 3,645,893
73 3,645,398
77 3,645,399
108 3,645,400
232 3,645,401
266 3,645,402

CLASS 211

13 3,645,403
168 3,645,404

CLASS 212

3 3,645,405
14 3,645,406
39R 3,645,407

CLASS 214

1BB 3,645,408
6BA 3,645,409
6N 3,645,410
36 3,645,411
377 3,645,412

CLASS 215

11R 3,645,413
3,645,414

CLASS 219

6.5 3,646,304
50 3,646,305
70 3,646,306
80 3,646,307
121P 3,646,308
125PL 3,646,309
135 3,646,310
137 3,646,311
146 3,646,312
200 3,646,313
208 3,646,314
210 3,646,315
222 3,646,316
241 3,646,577
271 3,646,317
300 3,646,318
347 3,646,319
401 3,646,320
464 3,646,321
549 3,646,322

CLASS 220

1.5 3,646,609
22 3,645,415
3,645,416
31S 3,645,419
41 3,645,417
55.3 3,645,418
60 Re.27,301

CLASS 222

23 3,645,420
57 3,645,421
169 3,645,422
207 3,645,423
402.1 3,645,424

CLASS 223

69 3,645,425
89 3,645,426
96 3,645,427

CLASS 224

2B 3,645,428
45G 3,645,429

CLASS 226

40 3,645,430
97 3,645,431
190 3,645,432
3,645,433
196 3,645,434

CLASS 228

3 3,645,435

CLASS 229

44R 3,645,436
3,645,437

CLASS 234

1 3,645,438

CLASS 235

60.49 3,645,439
61.11D 3,646,323
61.11E 3,646,324
61.11R 3,646,325
66 3,645,440
92EC 3,646,326
92TC 3,646,327
3,646,328
145R 3,645,441
150.1 3,646,329
150.3 3,646,330
151.3 3,646,331
176 3,646,332
181 3,646,333
3,646,334
3,646,335
3,646,336
186 3,646,337
201 3,645,442

CLASS 236

34 3,645,443
59 3,645,444

CLASS 238

10E 3,645,445

CLASS 239

14 3,645,446
15 3,645,447
3,645,448
17 3,645,449
116 3,645,450
206 3,645,451
227 3,645,452
237 3,645,453

CLASS 240

3 3,646,338
7.1R 3,646,339
11.4N 3,646,340
59 3,646,341
152 3,646,342

CLASS 241

4 3,645,454
20 3,645,455
29 3,645,456
60 3,645,457
175 3,645,458
191 3,645,459
299 3,645,460

CLASS 242

31 3,645,461
55.19 3,645,462
58.1 3,645,463
68.3 3,645,464
72.1 3,645,465
3,645,466
74.2 3,645,467
107R 3,645,468
118.4 3,645,469
182 3,645,470
3,645,471
3,645,472
210 3,645,473

CLASS 244

2 3,645,474
3.22 3,645,475
12B 3,645,476
46 3,645,477
103R 3,645,479
114 3,645,478
122AG 3,645,480
123 3,645,481
137 3,645,482

CLASS 246

169D 3,646,343

CLASS 248

4 3,645,483
80 3,645,484
223 3,645,485
243 3,645,486
354S 3,645,487
399 3,645,488
480 3,645,489

CLASS 249

50 3,645,490
61 3,645,491
68 3,645,492

CLASS 250

49.5ZC 3,646,351
49.5A 3,646,344
71.5R 3,646,345
83 3,646,346
83.3R 3,646,347
84.5 3,646,348
86 3,646,349
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DESIGN PATENTS

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U.S. GOVERNMENT PRINTING OFFICE: 0—1972

U. S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*